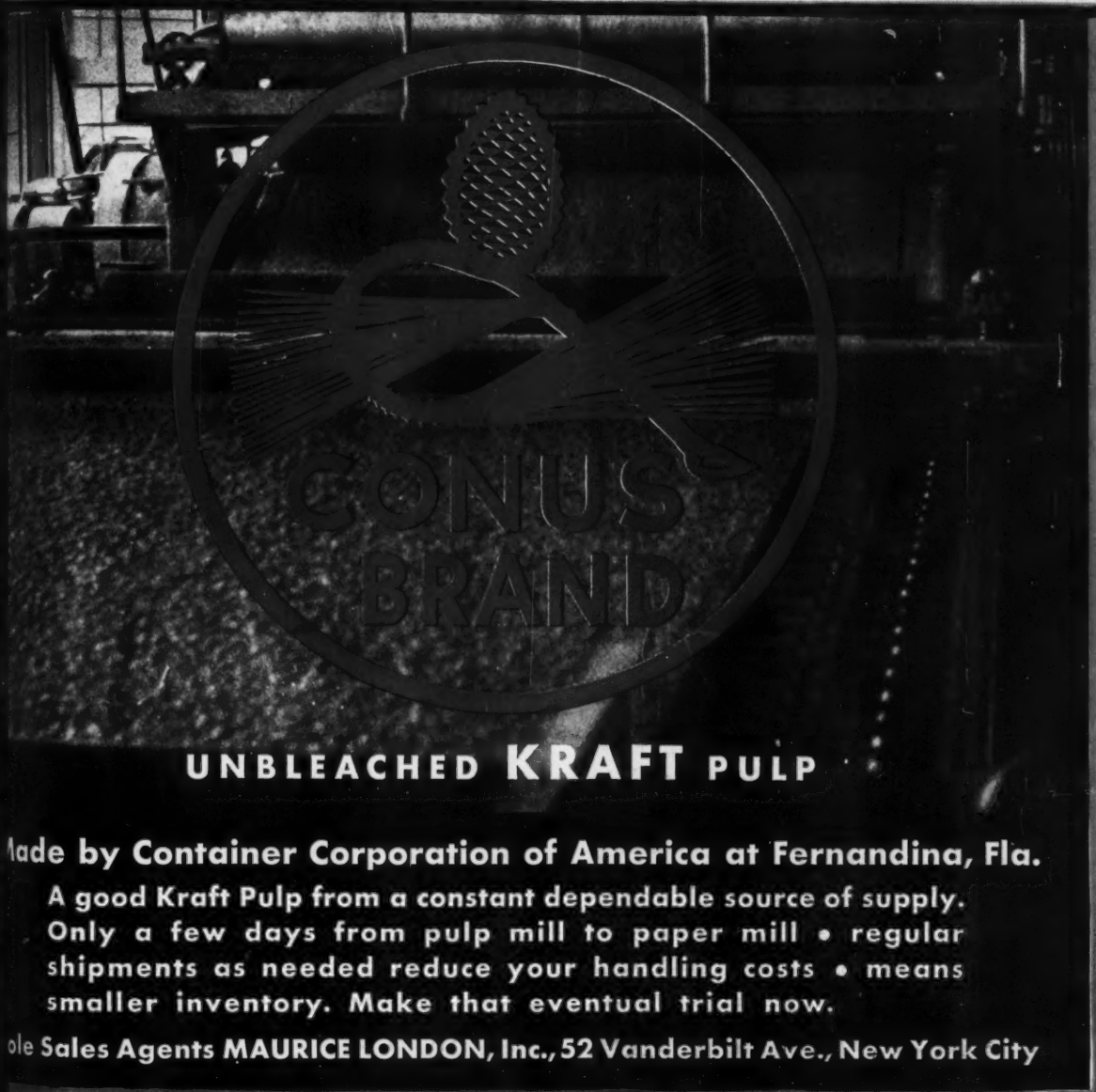
PAPER TRADE JOURNAL

THE INTERNATIONAL WEEKLY OF THE PAPER AND PULP INDUSTRY AND THE PIONEER PUBLICATION IN ITS FIELD



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OCT. 27 1938

Vol. CVII
No. 17

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Entered as second class matter at the Post Office at East Stroudsburg, Pa., under the Act of Congress of March 3, 1879. Published every Thursday by the Lockwood Trade Journal Co., at 34 N. Crystal St., East Stroudsburg, Pa. Executive and Editorial office: 15 W. 47th St., New York, N. Y. Domestic subscription U. S. and possessions, $4.00 per year.

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Published Every Thursday by the LOCKWOOD TRADE JOURNAL CO., Inc.

Executive and Editorial Offices: 15 West 47th Street, N. Y. C.
Western Rep.—H. K. Vinton, 123 W. Madison St., Chicago, Ill.

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The PAPER TRADE JOURNAL is indexed in Industrial Arts Index

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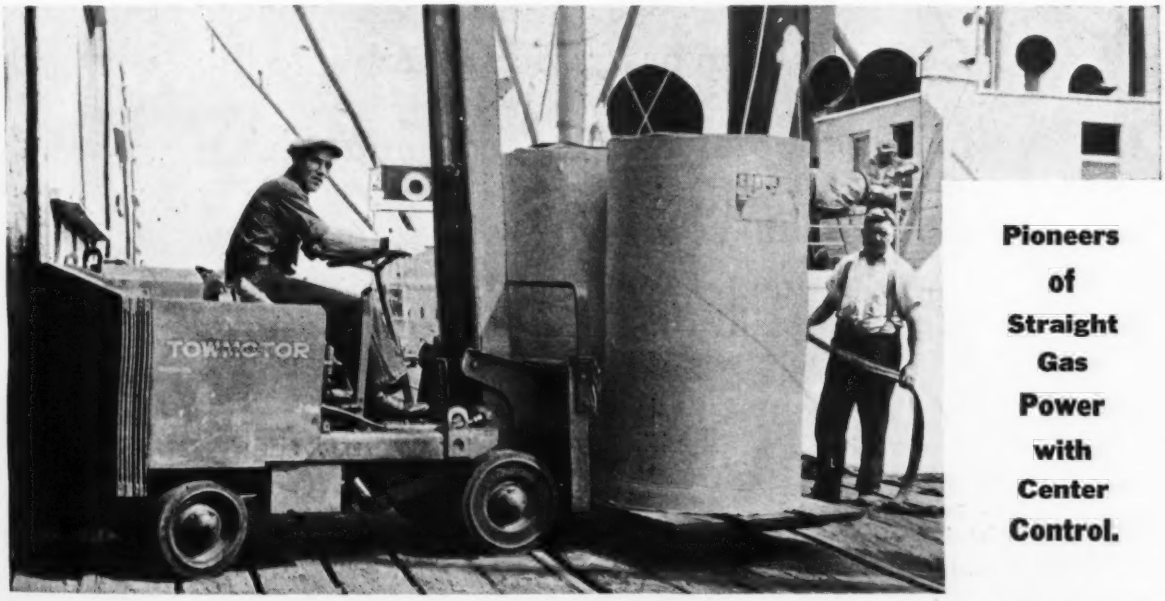

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SIXTY-SEVENTH YEAR

PAPER — PAPER

Established Feb. 17, 1899
Consolidated Nov. 16, 1899
with Paper Trade Journal.

Vol. CVII, No. 17 Thursday, October 27, 1938

Established Sept. 21, 1918
Consolidated Feb. 19, 1925
with Paper Trade Journal.

Broad Forestry Plan Urged for Wisconsin

Program To Provide Permanent and Economical Supply of Pulp Wood Advocated By University of Wisconsin — Labor Difficulties With Timber Workers — Paper Mills Meet Wage-Hour Demands—Other Late News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., October 24, 1938—A program to assure access to a permanent and economical supply of wood through a broad forestry program is advocated by the University of Wisconsin, in a bulletin issued last week. The university examined the Wisconsin forestry problems as part of a science inquiry.

At present Wisconsin mills are resorting more and more to the use of immature forests, the report pointed out. "Even so," it comments, "they are not able to secure enough raw material in Wisconsin. Of the 1,199,000 cords of wood consumed by Wisconsin pulp mills in 1937, only 405,263 cords were produced within the state. Moreover, the output of the pulp plants was not large enough to fill the needs of Wisconsin's paper mills, for the latter consumed the equivalent of 1,400,000 cords, including a considerable amount of ready-made pulp shipped in from the Pacific coast, Canada, and northern Europe."

It is also evident, the research study said, "That a market is not lacking at the present time. In fact, there is every reason to believe that the pulp and paper industries will be able to use increasing amounts of wood. . . . There are strong inducements for the state to hasten its preparations and be early in the field with a new timber supply."

More intensive reforestation also was urged at a meeting at Madison, Wis. last week of the Northern Lake States Regional Committee. It was pointed out there is need for more research on the technical and industrial resources available in the cut-over land areas of Wisconsin, Minnesota and Michigan. Immediate replanting of the cutover areas was urged, as well as the retiring of sub-marginal lands from farming and their use for forestry. A report prepared by a sub-committee will be the basis of a program on which federal action will be sought.

Paper Mills Meeting New Law Demands

No pronounced revision of operating schedules will be necessary in complying with the new federal wage-hours law effective nationally this week, because paper and pulp mills, in the main, already are following work week schedules within the law, and wage schedules also cover its provisions.

At the Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis., approximately 60 per cent of the employees will not be affected, L. J. Barrette, employment manager said, with 36 or 40 hour weeks already applied in their case. Of the remaining 40 per cent, some adjustment might be necessary, he said, in the event their hours accumulated some overtime during periods when the mill operates at capacity. With union agreements already covering payment of a time-and-a-half for overtime for the group, application of wage-hour standards would not materially affect the company.

Changes will be made in employment schedules of the Nekoosa-Edwards Paper Company, Nekoosa and Port Edwards, Wis. John E. Alexander, president and general manager, said his company will follow through the law and adhere to its provisions. He anticipated more workers would be given employment through application of the 44-hour week, but the number cannot be determined until a setup has been worked out. He termed the law one of the "biggest and broadest" programs ever attempted in industry, and commented that a large amount of detail must be handled in applying to the mills.

The Ahdawgam Paper Products Company, Wisconsin Rapids, Wis., is now operating on a 40-hour week basis and will not be affected.

Paper Industry Oppose Surcharge on Coal

Wisconsin paper manufacturers are on record opposed to a continuation of the year-old surcharge of ten cents per ton by the railroads on shipments of bituminous coal. When hearings were held before the Interstate Commerce Commission in Washington last week, J. M. Bryan appeared as a representative of the Wisconsin Paper and Pulp Manufacturers Traffic Association. He told the commission that continuation of the rates might force the paper industry to turn to oil, hydro-electric power and other sources for the power now supplied by coal. He testified industries might take a substantial increase on a temporary basis, "but when faced with that increase on a permanent basis, must take steps to protect their interests."

Railroads argued for continuation of the 10-cent surtax, scheduled to be ended December 31. They ask that it be made permanent, contending that truck

(Continued on page 26)

Canadian Newsprint May Remain at $50 Ton

Toronto Reports New Contracts Will Probably Be Made On $50 Per Ton Basis, Despite Rumors of $2 Cut For 1939 — Would Stop Pulp Wood Drives On Upper Nipigon—Mill Workers Council Meets—Other News.

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., October 24, 1938—A visionary glimpse of what the scientific laboratory holds for the future of humanity was given by Ernest L. Foss, of the research department of General Motors, Limited, Detroit, before the Toronto Board of Trade. He explained his statements of what is going on in the world laboratories today with wool made from milk, a super-silk made from glass, glass made from wood pulp and the current studies of the polorization of light under a new and as yet undisclosed patent. Mr. Foss stated that the future of the pulp wood industry of Northern Ontario may lie in the new plastic discoveries of the past few years. He showed how one type of plastic permitted 30 to 40 per cent more light to pass through it than ordinary glass, with the added advantage that it was virtually unbreakable and was impervious to varying weather conditions. That glass manufacturers had accepted the challenge was apparent from a new silk-like substance they had produced from the sand which formerly made glass. When used for insulation it was found that this substance could reduce the size of electric motors, fans and other equipment by more than 50 per cent.

Canadian Newsprint Price in 1939

Opinion is crystallizing that the price of newsprint will be unchanged in 1939 at least as far as Canadian manufacturers are concerned, say the Financial Post. Manufacturers will likely go ahead and enter new contracts on this basis although there was a rumor recently that the price would be reduced from $50 to $48 per ton. While there do not appear to be many reasons why the price should be advanced for 1939 there are a number of reasons why it should not be decreased. Any lowering of the figure on 1939 deliveries would not be justified from the producers point of view. Considering all the factors entering into costs the present figure is regarded as reasonable and fair and there would be some very definite disadvantages in reducing the price. A drop would not encourage or bring about an increase in the consumption of newsprint paper. In the last couple of years the costs of manufacturers have advanced appreciably, largely in the case of wages on the prospect of receiving higher prices for newsprint. Though the leaders of the industry are not committing themselves at this stage the opinion is gaining ground that they will endeavor to maintain the price and there is at present no strong signs among the buyers of opposition to the $50 figure. There has been a general increase in circulation rates this year netting the publishers far more than they have had to pay in increased paper costs.

Would Stop Pulp Wood Drives on Nipigon

The Chambers of Commerce of Fort William and Port Arthur, Ont., have forwarded to the Ontario government department of Game and Fisheries a suggestion that the upper reaches of the Nipigon river, which is a famed trout stream, should be preserved as a tourist fishing ground. As a result of an extensive pulp wood cutting program, the Nipigon is now threatened to be lost for all time as a fishing stream. It has been suggested that pulp wood drives be diverted through other available channels into the lower reaches of the stream.

It is not lawful to deface saw or pulp wood logs and Arthur Messier, of Gatineau Point, was recently sentenced to one month in jail for defacing pulp wood owned by the Canadian International Paper Company.

Mill Workers Council Meets October 29

A meeting and dinner of the Northern Ontario District Council of Paper Mill Workers will be held in Port Arthur on October 29 to consider several important matters. It is expected that about two hundred delegates from unions will attend representing paper mills in Port Arthur, Fort William, Iroquois Falls, Sault Ste Marie, Smooth Rock Falls, Kapuskasing, Dryden and Kenora. Representatives of the Ontario Department of Lands and Forests will be present as well as the presidents of Trades and Labor Councils.

Will Sell Pulp Wood of Lake Sulphite Co.

It is understood that about 127,000 cords of pulp wood which were cut last season for the Lake Sulphite Pulp Company, Limited, Red Rock, which went into liquidation last winter, will be sold by E. E. Johnson, of the Pigeon Timber Company, Fort William, Ont., who is an extensive contractor in logs and pulp wood.

Plans for Herty Memorial Forests

[FROM OUR REGULAR CORRESPONDENT]

WAYCROSS, Ga., October 24, 1938—The Georgia division of forestry will designate a specific plot on the Baxley demonstration forest in Appling county, as a Herty Memorial Forest, it is revealed by Frank Heyward, Jr., director of the division.

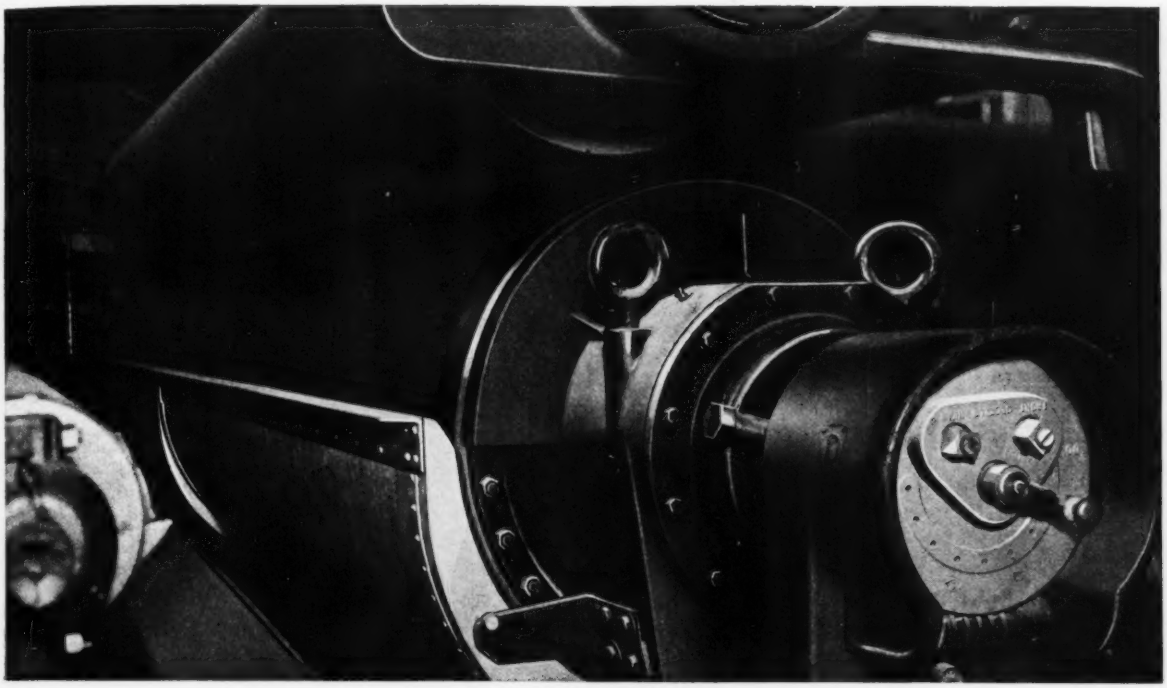
Several South Georgia and North Florida counties already have launched plans for the establishment of Herty Memorial Forests, in tribute to the late Dr. Charles H. Herty, who founded and directed the Savannah Pulp and Paper Laboratory.

"We hope to have a forest plot set aside in every county of the slash pine area as a living monument in trees to the man who has made the greatest contribution of all time to the forestry industry in the Southeast," J. S. Elkins, secretary of the Slash Pine Forest Association says.

Mr. Heyward says that a 100-acre plot will be set aside in the Baxley demonstration area, fronting on United States Highway No. 1. A suitable marker will be placed on the plot designating it as a living memorial.

Plans are being made for its dedication.

SUCTION PRESS ROLLS *built by your favorite* MACHINE BUILDER



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Pictured above is one of two Stowe-Woodward covered suction press rolls on the new machine at National Container Corp.

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Demand For Paper Expands in Chicago Area

Many Grades of Paper Reported More Active In Mid-west With Current Mill Prices Firm—Waste Paper Market More Active As Mill Demand Expands — Simplified Millinery Box Sizes Accepted — Other News.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., October 24, 1938—Highlight of the week's market news is the reported firming up in the local waste paper market, considered an encouraging forerunner for all local paper trade. Practically all of the common grades of waste paper are said to be in demand by the mills. Dealers are having no difficulty in disposing of accumulations and indications point to the likelihood of present mill prices at least remaining the same, if not increasing, for November. The box board industry as well as the roofing mills have contributed substantially lately to the increased demand.

The firmness of the waste paper market, impressive because of recent weaknesses, is reflected in other markets. Bonds and ledgers are reported to be expanding steadily with all grades of sulphite papers, for example, firming up in encouraging fashion. Cover stock is in good demand while reports from representatives of the book mills also indicate response to general better feeling. Unseasonably warm weather has retarded retail development but the kraft market, among others, believes itself more or less soundly entrenched for future improvement. Newsprint markets are reported as comparatively firm with groundwoods also in broadening demand. The paper board market is reported to also have improved materially.

Simplified Box Sizes Accepted

The U. S. Department of Commerce has announced that signed acceptances have been received from a sufficient number of box manufacturers, department stores and others interested to indicate that the proposed Simplified Practice Recommendation covering standard dimensions for Stock Folding Boxes for Millinery is generally acceptable to the trade. The recommendation for stock millinery boxes is as follows:

Size—10 x 10 x 7—2 inch cover, 12 x 12 x 7—2 inch cover, 14 x 14 x 8—2 inch cover, 16 x 16 x 8—2 inch cover, 18 x 18 x 8—2 inch cover. Caliper, .030; .030; .030; .032; .035.

The changes are said to make for fewer sizes and calipers of boxes eliminating unnecessary inventory; larger runs and increased rates of turnover; elimination of slow-moving items; development of uniform demand and elimination of tendency to countenance small reductions in size or small reductions in caliper.

Honor For Old Chicago Firms

The State Street Council, organization of retailers along one of the world's greatest shopping thoroughfares, is planning an annual meeting and dinner for October 27 at which time old Chicago firms will be given proper recognition. A special program has been provided with singing, pageantry in the spirit of the Gay Nineties. Included among the names of those old firms who will be thus honored, together with the dates of their founding, are the following well known paper firms: J. W. Butler Paper Company (1844); Bradner Smith & Company (1852); Messinger Paper Company (1865); Merz & Son Box Company (1867); Hanchett Paper Company (1871); Pioneer Paper Stock Company (1880); Inlander-Steindler Paper Company (1887); Levin Brothers Paper Company (1892) and the Moser Paper Company (1893). Mayor Edward Kelly is to give the principal address at the dinner honoring these and other veteran Chicago firms.

Wheelright Bristol Announcement

It has been recently announced that Wheelwright Bristols are now stocked by the following Chicago firms: Berkshire Papers Inc., Bermingham & Prosser, La Salle Paper Company, Messinger Paper Company, Midland Paper Company and the James White Paper Company. A total of one hundred and sixty-four items in bristols, indexes and blanks are represented. The broadened distribution is announced as designed to facilitate prompt service and speedy delivery in the greater Chicago area. The announcement is printed on Superfine Bristol, White, 22½ x 28½ —280 (M).

Paper Trade Active in Community Fund

Chicago's paper trade began this week the interesting task of raising its share of the Community Chest fund designed to meet all emergencies not otherwise taken care of by recognized groups. The usual quota of splendid public spirited paper executives will handle the various divisions of activity.

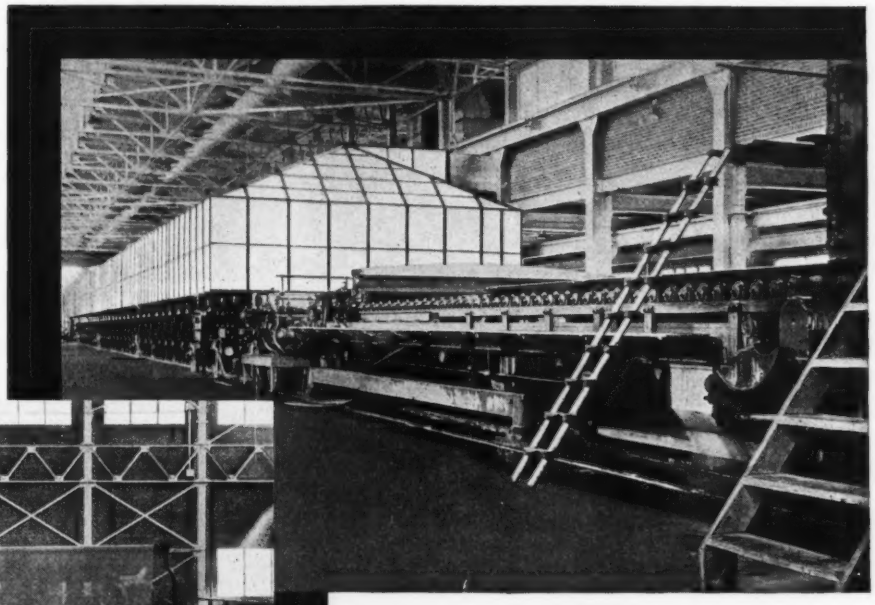
Chemical Foundation Loses Appeal

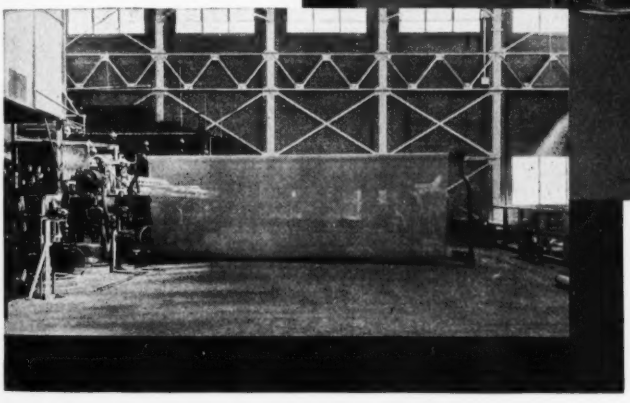
On September 23, 1938 the U. S. Circuit Court of Appeals handed down its decision unanimously affirming the decree of the U. S. District Court for the District of Delaware, which had dismissed the complaint of the Chemical Foundation, Inc., to compel the transfer to it of titles to certain patents granted to Richard Herz, and assigned by him to the General Analine Works, Inc.. These patents cover the manufacture of intermediates for the production of the well known Hydron Pink and Orange. General Dyestuff Corporation is sole agent for General Analine Works, Inc.

Announces "New Paper Man"

A new son and heir was born on September 24 to Mrs. Gould and Harry E. Gould, president of the Aldine Paper Company, and in celebration of this arrival, "Senior" is handing out cigars, champagne and caviar. A miniature paper machine is being built for the new paper expert and "Senior" has already bought a set of golf clubs for the future Bobby Jones. Open house is being held at 1010 Fifth avenue, New York City, where "Senior" says the "new paper man" is being displayed.

THE BELOIT *Removable Fourdrinier*





● Wire is strung in aisle while machine is in operation, if desired.

● Fourdrinier pit can be washed out while wire is being installed.

● Wire bundle is taken from shipping box and mounted directly in carriage—no chucks to apply—no further handling as bundle is unreeled as carriage moves along to form wire loop.

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● Safest — most convenient — quickest method of installing Fourdrinier wire.

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Lightweight News May Increase Demand

New Lightweight Paper For Newspapers and Magazines Now In Development In England May Stimulate Newspaper Circulation—High Air Rates Deterrent Now — Fine Paper Trade Reduces Prices—Other News.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., October 24, 1938—The influence of air services on newspapers has again been demonstrated here. Signalizing the inauguration of the Trans-Canada Air Express, Toronto newspapers were delivered in Montreal a day or two ago carrying a tip on reading "Printed in Toronto this afternoon; delivered here this afternoon." Toronto is approximately the same distance from Montreal as New York. What significance this innovation may hold for newspaper circulation not only here in Canada, but all over the continent, as well as in the exchange of American and British newspapers over the Atlantic when the air services start shortly over that ocean, remains to be seen. But it is giving another stimulus to the question, already being tackled in England, of evolving new lightweight printing papers for newspapers and magazines.

High Air Rate a Deterrent Factor

As a matter of fact the use of airplanes for despatch of newspapers to out-of-town subscribers is not yet practicable owing to the high rates charged. Although present newspaper rates by air mail are high, the Post Office authorities point out that they barely cover the cost, and it is doubtful whether the public would sanction less-than-cost transportation. The only solution seen at present is lightweight paper for newspapers, and also for magazines, such as is now being used to a limited extent by British publishers. This brings into question the extra cost to publishers of such papers. First, however, it constitutes a challenge to the paper-making industry for experiments in the production of lightweight paper, both as to practicability and cost.

In Canada the use of the airplane for transportation to the mining centres of the North is growing by leaps and bounds. Hitherto publishers of newspapers and magazines have been paying 4 cents per pound for air transportation of their publications to such outlying points. Now the Ottawa postal authorities have announced that postal rates for newspapers and magazines to such points will be increased, ranging from 12 cents per pound to as much as 70 cents per pound to the newest great mining field at Yellowknife, in the Northwest territories and $1.40 per pound to Aklavik, in the Arctic Circle. Publishers supplying such places have had to cancel subscriptions, as obviously they cannot afford to send a three-quarter pound newspaper even to the less-distant points at 72 cents per pound, or 9 cents for one issue, while the subscription for an ordinary city daily to Aklavik would cost $427 per year for postage. For magazines, with their heavier paper, the cost of course, is much higher.

While these rates are prohibitive, the postal authorities declare they constitute the cost by air only, and include nothing to pay for the cost of land transportation to the point of tranfer to a mail plane. Therefore it looks as if this question can only be solved—if it can be solved—by new light-weight printing papers.

The Fine Paper Industry

Recent reductions in prices by the fine paper industry are reported to have brought in some deferred buying, although business is largely on a hand-to-mouth basis. Tonnage sales of Howard Smith Paper Mills, Ltd., leading company in the industry, to date are well below 1937, though on a dollar basis they compare less unfavorably with previous years.

Current business, however, is running well above the corresponding 1937 period. Not only has there been the stimulus of lower prices, but last year sales in the fine paper industry started to turn downward in August and business in final months of the year was at a substantially reduced level.

Despite present upward trend in sales, Howard Smith earnings for the full year—barring a spectacular upturn from now on—will be below 1937, when $2.11 a share was earned on the 329,663 outstanding common shares. Present indications are that results will show a substantial improvement over the 85 cents a common share earned in 1936, and will be moderately below the $2.11 a share reported last year.

Benefitting current year's earnings has been increased operating efficiency resulting from over $2,000,000 spent during the past two years on improvements and new machinery. These economies have more than offset increased labor costs.

Newsprint Exports

A report just issued by the Dominion Bureau of Statistics shows that exports of newsprint in September amounted to 3,911,722 cwt., valued at $8,523,555, as compared with 4,392,214 cwt., valued at $9,621,715 in August, and 6,173,095 cwt., valued at $11,303,766 in September of last year. The decrease was almost entirely due to falling off in shipments to the United States, to which the exports were 3,213,354 cwt., valued at $7,149,027, as compared with 3,639,740 cwt., valued at $8,133,637 in August. There was a decline also in the month's exports of wood pulp, the total for September being 1,116,340 cwt., valued at $2,304,564, as compared with 1,166,966 cwt., valued at $2,833,241 in August. Pulpwood exported in September totalled 255,333 cords, valued at $2,313,462, as compared with 279,795 cords, valued at $2,559,320 in August.

Bird & Son Push Production

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., October 24, 1938—The work of rehabilitation in New England since the hurricane has been progressing. Bird & Son, Inc., East Walpole, Mass., are reported to be working night and day in the production of roofing paper to be used by those making repairs and rebuilding.

● Experience counts—and counts heavily—in producing and servicing such an important product as liquid chlorine. That's why EBG, America's pioneer producer, is favored by many of the country's most exacting users. They know that EBG has the experience to handle all problems and meet all requirements wherever liquid chlorine is used. You hear it often—"They know their stuff at EBG!"

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EBG Liquid Chlorine

FIRST IN THE COUNTRY

Financial News of Pulp and Paper Industry

Johns-Manville Reports Consolidated Net Earnings of $882,366 For the September Quarter — American Writing Loss Is $127,115 For Nine Months — Kimberly-Clark Corp. Reports $150,644 For Third Quarter.

NEW YORK STOCK EXCHANGE

High, Low and Last for the Week Ending October 26, 1938

	High	Low	Last
A. P. W.	3⅜	2¾	3⅜
Armstrong Cork Co.	45½	43¼	45⅛
Celotex Corp.	29¾	28¼	29½
Celotex Corp., pf.	69	68¾	69
Certain-Teed Products Corp.	12½	11⅛	11⅞
Certain-Teed Products Corp., pf.	45¾	42¾	43¼
Champion Paper & Fibre Co.	29¼	27¾	29¼
Champion Paper & Fibre Co., pf.	98	97	98
Congoleum-Nairn Co.	28⅜	27	27
Container Corp. of America	17¼	16¼	16¾
Continental-Diamond Fibre Co.	10¼	9⅞	10
Crown-Zellerbach Co.	19½	13⅜	19½
Crown-Zellerbach Co., pf.	88	86¼	87
Flintkote Co.	29	27⅜	28½
Robert Gair	5⅛	4⅝	5⅛
Robert Gair, pf.	15½	14	15½
International Paper & Power	13¼	10	13¼
International Paper & Power, pf.	49⅜	42½	49¼
Johns-Manville Corp.	108¼	101	102¾
Johns-Manville Corp., pf.	126¼	126¼	126¼
Kimberly-Clark Corp.	27½	27	27
MacAndrews & Forbes	29½	29	29
Masonite Corp.	60	58	58
Mead Corp.	14½	13½	14⅜
Mead Corp., pf.	80	80	80
Paraffine Companies, Inc.	57⅛	54½	57
Paraffine Companies, Inc., pf.	100	99¾	99¾
Ruberoid Co.	33	31¾	32¾
Scott Paper Co.	49¾	48¾	49¼
Sutherland Paper Co.	31	29½	31
Union Bag & Paper Corp.	14¼	12⅝	14¼
United Paperboard Co.	8⅜	6¾	8⅜
U. S. Gypsum Co.	108½	105⅞	107
U. S. Gypsum Co., pf.	172	171½	171½

NEW YORK CURB EXCHANGE

High, Low and Last for the Week Ending October 26, 1938

	High	Low	Last
American Box Board Co.	12	11	11½
Brown Co., pf.	26½	25	25
Great Northern Paper	35	35	35
St. Regis Paper Co.	4⅛	3⅞	4
St. Regis Paper Co., pf.	71	69½	70
Taggart Corp.	6⅛	5⅛	5⅞

$882,366 For Johns-Manville

Consolidated net earnings of the Johns-Manville Corporation and its subsidiaries amounted to $882,366 in the three months ended September 30, according to a financial statement made public by Lewis H. Brown, president. The net was equivalent, after dividend requirements on the preferred stock, to 89 cents each on 850,000 shares of outstanding common stock. It compared with $1,780,857, or $1.94 a common share, earned in the third quarter of last year.

Operations in the first nine months of this year resulted in consolidated net earnings of $857,469, or 55 cents a share on the common stock, after provision for preferred dividends. In the corresponding period of 1937, consolidated net earnings were $4,592,191, or $4.94 a common share.

Sales in the third quarter aggregated $12,341,457, a decrease of 25 per cent compared with $16,397,160 in the September quarter of 1937, but an increase of $415,744 over the $11,925,713 reported for the second quarter of this year. Manufacturing, selling and administrative expenses in the third quarter decreased 20 per cent to $10,725,129 from $13,467,588 a year earlier. Sales in the nine-month period this year declined 25 per cent to $34,702,289 from $46,188,636 in the nine months ended with September, 1937. Manufacturing, selling and administrative expenses absorbed $31,837,059 in the 1938 period, a decrease of $6,620,231 compared with $38,457,290 in the first nine months of last year.

Earnings of the Johns-Manville Credit Corporation, a wholly owned subsidiary, which are not consolidated with those of the parent company, amounted to $162,954 in the first nine months of 1938, against $159,788 earned in the same period a year before.

American Writing Reports Loss

HOLYOKE, October 24, 1938—The operating loss of the American Writing Paper Corporation for the first nine months of this year was $127,115.91, according to a financial statement made to the stockholders today. Recent flood losses are estimated at $8,500. The complete statement follows:

The loss for the third quarter of 1938, after all expenses but before interest on Federal Reserve Bank loan commitment ($630.14) and before providing for interest on the General Mortgage Bonds, was $46,030.76. Recent flood losses, not included in the foregoing, are estimated at $8,500.

For the corresponding period in 1937, after all expenses but before interest on Secured Notes Payable ($3,780.83) and before providing for interest on the General Mortgage Bonds, the loss was $31,050.05.

The loss for the first nine months of 1938, after all expenses, exclusive of flood losses previously referred to, but before interest on Federal Reserve Bank loan and commitment ($4,301.39) and before providing for interest on the General Mortgage Bonds, was $127,115.91.

National Gypsum Reports $751,008

The National Gypsum Company and subsidiary reports as follows for the nine months to September 30: Net profit, $751,008, equal, after dividend requirements on 7 per cent first and 5 per cent second preferred stocks, to 41 cents each on 1,261,458 shares of $1-par common, against $709,780, or 41 cents a share, on 1,174,382 common shares last year. September quarter: Net profit, $355,505, equal, after dividend requirements on preferred stocks, to 22 cents a share on 1,261,458 common shares, compared with $238,328, or 17 cents each, on 1,234,458 common shares in June quarter and $199,900, or 10 cents a share, on 1,174,382 common shares in September quarter of 1937.

Kimberly-Clark Earns $150,644

[FROM OUR REGULAR CORRESPONDENT]

NEENAH, Wis., October 24, 1938.—Kimberly-Clark Corporation reports net profit on common stock for the quarter ending September 30 at $150,644.75, as compared with $322,194 for the same period in 1937, according to the financial statement issued last

week. Earnings for the previous quarter of 1938, ending June 30, were $275,213.76. The net for the last quarter was equal to 31 cents per share on 488,-173 shares of common stock outstanding September 30, as compared with 66 cents per share in the corresponding quarter of 1937.

Sales for the quarter amounted to $6,214,925.88, bringing the total for the twelve months ended September 30 to $26,466,785.42. The net profit for the twelve months was $1,381,911.34, equal to $2.83 per share on common stock, as compared with $3.13 for the corresponding period of 1936-37. Provision was made for $597,780.00 in dividends on preferred stock for the year ending September 30.

Abitibi Earnings Higher

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., October 24, 1938.—For the month of September the earnings of the Abitibi Power & Paper Company, Toronto, prior to charges for depreciation and bond interest amounted to $300,225 compared on a similar basis with $250,338 in August and $417,269 for September last year, according to G. T. Clarkson, receiver and manager. Shipments of newsprint in September amounted to 26,741 tons compared with 24,545 in August and 44,928 in September, 1937. Present indications are that shipments of newsprint in October will be about 29,000. Shipments of sulphite pulp in September amounted to 3,274 tons compared with 3,244 in August and 4,874 in September last year. Present indications are that shipments of sulphite pulp in October will be about 3,500 tons.

Hinde & Dauche Report $159,457

The Hinde & Dauch Paper Company, reports for the quarter ended September 30, profit $159,457 after taxes and charges, equal to 32 cents a share on 360,-250 shares of common stock, compared with $436,-840, or $1.09 a share in the September quarter a year ago and $136,036, or 25 cents a share in the June quarter this year. For the nine months, ended September 30, profits were $480,397, or 96 cents a share, against $1.245,846, or $3.06 a share in the nine months ended September 30, 1937.

Brown Co. Asks To Issue Certificates

PORTLAND, Me., October 24, 1938—Trustees of the Brown Company, pulp and paper manufacturing concern, has sought permission in Federal Court to issue trustees' certificates from the proceeds of which $500,000 of $693,175 owed in taxes in Maine, New Hampshire and Vermont would be paid.

Ernest H. Maling, controller, told Federal Judge John A. Peters, who took the petition under consideration, that the company owed taxes of $30,863 for 1936, $134,940 for 1937, and $527,372 for 1938.

U. S. Gypsum Nets $1,607,725

The United States Gypsum Company reports for the quarter ended September 30, consolidated net income $1,607,725, or $1.23 a common share; for same 1937 period, net income $1,456,307, or $1.11 a share. For nine months ended September 30, net income $3,788,945, or $2.83 a share; for corresponding 1937 period, net income $4,857,560, or $3.73 a share.

Philadelphia Association Meets

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., October 24, 1938.—The Philadelphia Paper and Cordage Association held its October meetings with luncheon in the Hotel Adelphia on Friday, October 21st. The Membership Committee presented the names of two new applicants for membership, and these were unanimously approved. They were the Gummed Products Company, Troy, Ohio, manufacturers of gummed cloth and paper, represented locally by Lee F. Johnson, City Line east of Ridge avenue, Philadelphia, and Bloomer Brothers Company, Newark, N. Y., manufacturers of egg cartons, ice cream boxes, etc., represented locally by Chas. F. Klefeker, 6602 Woodcrest avenue, Phila. The luncheon meeting was also the occasion for awarding the prizes to the winners of the final golf tournament, which was held September 28th at Spring Mill Course of the Philadelphia Country Club.

The Buffalo Envelope trophy for the lowest net score for the year was awarded to Arthur Brosius of Satterthwaite Cobaugh Company. Howard Satterthwaite of the same company was second. Other prizes were awarded to L. A. Dodd, for the low net score for the day; Bob Reed of Quaker City Paper Company for winning the Putting contest, and E. Line of the United States Chamber of Commerce for winning the Hole-In-One contest. The final prize of the day was awarded to B. McAllister for high score. A vote of thanks was given to E. L. Richards, chairman of the Golf Committee for his splendid efforts in conducting the series of golf tournaments which were such an outstanding success. A glowing tribute was paid "News 'n Nonsense", a new monthly bulletin, the first issue of which was mailed out two weeks ago by Fred I. Brower of Atlantic Gummed Tapes, as editor. Two copies of "News 'n Nonsense" were autographed by all the members present and president Joe Miller of Garrett-Buchanan Company, mailed these to Sam Shryock and James Anderson, both of whom were absent by reason of illness.

Jack Howarth and George Hooper, who are collaborating in assembling the letterheads for the new Buyers' Guide and Directory, reported that the letterheads are coming in satisfactorily; they again stressed the importance of all members including on their letterheads all of the items which they are able to supply. The suggestion that the Association's seal be imprinted on all of the letters was received with enthusiastic approval.

E. K. Lay, chairman of the Entertainment Committee, reported that the plans for the annual Christmas Party to be held on Tuesday, December 20th at Adelphia Hotel, were well under way. President Joe Miller appointed E. L. Richards as chairman of the Nominating Committee and directed him to prepare a list of candidates to be submitted at the November meeting.

Now Maurice London, Inc.

Owing to the withdrawal of Mr. Krudener, the corporate name of London & Krudener, Inc., has been changed to Maurice London, Inc. The new firm announces that it will continue under this name as sole selling agent for Conus unbleached kraft pulp produced by the Container Corporation of America at Fernandina, Fla., and will also transact a general wood pulp business.

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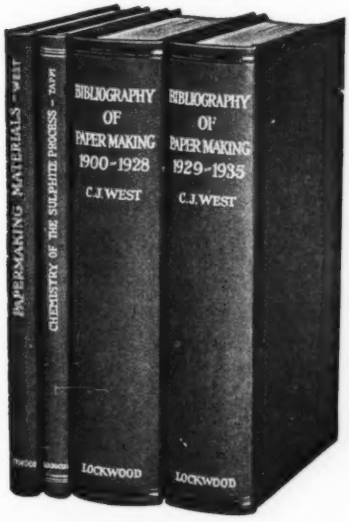
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FOR PAPER MEN

Hand-Made Paper Manufacture Demonstrated

The New York State College of Forestry exhibit at the New York State Fair this past fall, featured the Department of Pulp and Paper Manufacture. It was one of the most successful displays ever presented by the College of Forestry in a quarter of a century of State Fair exhibiting. A great variety of paper products, ranging from two jumbo rolls of newsprint, to milk bottle caps, and making use of colors running from plain white to the brilliant hues of Christmas wrappings, gave visitors at the State Fair a new concept of the importance of the paper industry.

Two large wheels attracted special interest. On one, arranged like the spokes of a wheel, were mounted new and popular books furnished by the Book-of-the-Month Club of New York City. On the other there was a similar arrangement of popular magazines. At the hub of each wheel was a sign carrying a caption, "The World's Ideas Circulate on Paper". The two slowly revolving wheels, one bearing books with vivid paper jackets, and the other magazines with colorful front page illustrations were flanked by a display of assorted kinds of paper and paper products, thereby giving the public a good idea of the great variety of ways in which paper is being utilized.

High Spot of the Exhibit

The demonstration of hand-made paper making was the high spot of the exhibit. Three attendants in uniform dress, two of them graduate students of the Department of Pulp and Paper, and one of them an assistant in the Pulp and Paper Laboratory, worked as a unit behind an attractively arranged line of machines and equipment, separated from the public by a low barrier of cedar boughs. The hand paper making demonstration began with one of the assistants soaking sheets of 100 per cent bleached sulphite pulp and feeding it into a Dilts laboratory beater. When sufficiently prepared, the stock was removed to a vat. Here the assistant, taking one of the two hand-moulds made in England especially for the exhibit by J. Barcham Green & Sons, collected the fiber on the wire of the mould, which carried as a watermark the seal of the State of New York. One of the moulds was constructed with a laid wire while the other was woven. The crowds were usually surprised to see the affinity of wool felt for wood fiber, as the wet sheets were removed from the moulds by couching on ordinary paper making felts.

NEW YORK STATE COLLEGE OF FORESTRY DEMONSTRATES HAND-MADE PAPER MANUFACTURE.

The second assistant now sandwiched each sheet between wool felts until a book of fifteen sheets was built up and placed under a hydraulic press to remove a large amount of the water from the sheets.

The third assistant placed the sheets between blotters and fed the papers into an electric drier. As the sheets were removed from the blotters, each sheet was stamped to indicate that it was made by hand. The complete operation required approximately one minute for each sheet.

Eighty-one Demonstrations Made

During the thirteen days of the fair, August 28 to September 10; eighty-one demonstrations were carried out, and 2,423 sheets of paper distributed. High point in hand paper production was reached on Labor Day, when 349 sheets were made and distributed. By actual count, more than 5,000 people were in attendance at the demonstrations while many thousands of others saw parts of the demonstration and the exhibit.

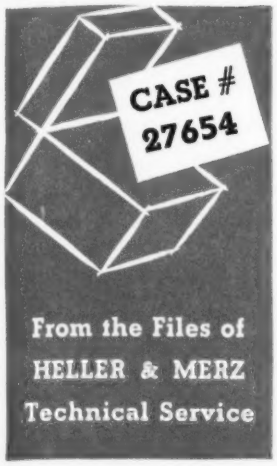
The longer wall of the L-shaped exhibit space was divided into three panels. One panel showed two unusually large photographic views of the College of Forestry newly installed experimental paper machine, unique in laboratories in this country. A second panel depicted views of the wood chipper, grinder, beater, digester, Oliver filter and the air-conditioned paper testing laboratory, now a part of the College laboratory equipment.

The third panel carried a large cut-out map of the State of New York showing location of the State's 142 active paper mills and 33 active pulp mills. A chart included in the same panel gave a brief summary of the economic importance of the paper industries of the State and pointed out that New York is the largest producer of paper and paper-board in the United States.

At one end of the exhibit was piled a full cord of pulpwood with a sign indicating that one and three-fifths cords were required to make the two rolls of newsprint on display, and helped to signify the importance of wood to the paper industry by pointing out that over 90 per cent of all paper is made from wood.

Guessing Contest Lends Interest

In the guessing contest 1700 people tried their hand in estimating the number of linear feet of paper in two jumbo rolls of newsprint. Estimates ran all the way from 6½ feet to nine million feet. It was interesting to note that women outguessed the men and won the first three prizes, the winner coming remarkably close in estimating the total length



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Defoamer HM has the virtue of economy—and the even more important one of delivering the goods. When used directly in the beater, it prevents foam from getting out of hand. Or, when dripped or sprayed into the head box, it breaks up foam which has already formed.

We're anxious to have you give Defoamer HM a workout in your own plant, so just say the word and we'll send you a sample together with full directions covering its most effective use.

This new aid to paper men is another case where our Technical Service Men have looked and listened right on the scene of trouble, put their heads together—and come out of their huddle with a real improvement over a product as they found it.

If their dye knowledge and practical mill experience can be of help to you in smoothing out some problem that is eating production time or raising costs, their assistance is yours for the asking. Just write or wire our main office or nearest branch office—and by all means write for a sample of Defoamer HM today.

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of the two rolls to be 46,685 feet, the actual length being 46,630 feet.

Nearly 13,000 publications on forestry and conservation were distributed to the throngs who visited the pulp and paper display in the State Institutions Building. The attendance at the 1938 New York State Fair was 363,770, the largest on record.

Professor Clarence E. Libby is in charge of the laboratories and head of instruction in the Department of Pulp and Paper Manufacture at the New York State College of Forestry. The exhibit was a cooperative project between this Department and the Extension Department of the College where Professor Floyd E. Carlson is in charge of the exhibits.

BROAD FORESTRY PLAN URGED

(Continued from page 13)

lines, particularly popular in the middle west, were responsible for a decrease in business, but that if the railroads cut their rates, the truckers probably would further reduce theirs. Continuation of the surcharges is desired to prevent reductions in rail operating revenues.

Labor Difficulties with Timber Workers

Labor difficulties with timber workers last summer in Gogebic County, Michigan, have resulted in the filing of a series of lawsuits, and have brought into the controversy D. C. Everest and John Stevens, Jr., vice-president, and P. M. Wilson, secretary, of the Marathon Paper Mills Company, Rothschild, Wis. They are named because their timber operations happened to be in the striking group and responsibility is placed on them.

Plaintiffs in the actions are Henry Paull, labor attorney of Duluth, Minn., and Luke Raik, president of the American Federation of Labor Lumber and Sawmill Workers Union of Gogebic County. They charge the lumber firms and their officials with responsibility for alleged assault and violation of the Lindbergh kidnaping law in the clubbing and expulsion of the plaintiffs from Michigan on June 30, 1937. The defendants are also accused of violating the NLRB Act. Marathon officials have made no statement concerning the charges.

Financing of Power Project Deferred

No announcement is expected from PWA and RFC in Washington until after the November elections as to whether funds will be forthcoming for the $26,000,000 Wisconsin-Fox power plant and reservoir project contemplated by the Wisconsin Hydro Authority, according to the latest reports. The matter has been injected into state politics, and if approved before election credit would go to Gov. Philip F. La Follette, a candidate for reelection, and the candidates of the Progressive party. It is said the New Deal refuses to grant the funds now in the belief such a decision would hurt the chances for reelection of Senator F. Ryan Duffy, Roosevelt-approved Democrat.

New Warehouse for Paper Institute

Construction of a $4,000 warehouse has been started by the Institute of Paper Chemistry, Appleton, Wis. It is being built on the east side of the Institute buildings and will be used to store materials used at the Institute. The building will be 30 by 40 feet in size, of frame construction on concrete pilings. Fraser Lumber Company, Appleton, has the contract.

Balliet, Van Nortwick and Sudke Nuptials

David Balliet of Appleton, Wis., who is employed at the Kalamazoo Wax Paper Products Company, Kalamazoo, Mich., and Miss Cornelia Ruprecht of Batavia, N. Y., were married October 15. The ceremony took place at the rectory of St. Augustine's church, Kalamazoo. Mr. Balliet is a graduate of the University of Chicago. The couple will be at home after December 1 at 908 Fairbanks Ave., Kalamazoo.

Another marriage October 15 was that of William Van Nortwick, Jr. of Appleton, Wis., and Miss Mary Luella Finnegan of Oak Park, Ill. The wedding took place in the parsonage of St. Giles church at Oak Park. Mr. Van Nortwick is the son of William Van Nortwick, manager of the Green Bay and Mississippi Canal Company of Appleton. He is associated with the Seaman Paper Company in Chicago. The couple will reside at Oak Park.

Edward Ludke, chemist at the Thilmany Pulp and Paper Company, Kaukauna, Wis., and Miss Ruth Fowler of Birmingham, Ala., were married October 18 at St. Mary Catholic church at Menasha, Wis. After a honeymoon trip to Alabama and Florida, Mr. and Mrs. Ludke will reside at 702 W. Wisconsin Ave., Kaukauna.

No Certificate Required

"Many mills in various groups in the industry have questioned the American Paper and Pulp Association and counsel concerning the necessity for guaranteeing on invoices or in any other manner full compliance with the Fair Labor Standards Act of 1938 which went into effect Monday, October 24. In each case counsel has replied" according to Charles W. Boyce, executive secretary of the association, "that there is nothing in the Statute requiring such certificate or warranty.

"Whether or not an individual mill signs such a certificate or warranty is entirely up to that mill. It is presumed that every citizen is law-abiding and it is unnecessary to certify that a law is being obeyed unless there is a specific requirement for certification in the law. There is no such requirement in the Fair Labor Standards Act.

"However, if a mill does give such warranty, it should consider carefully the coincidental action that it should take, particularly if the guarantee covers ingredients. One clause that has been proposed is that 'all the goods and every part and ingredient thereof hereby sold to you were produced under the terms and conditions of employment which satisfy all requirements of the United States Fair Labor Standards Act of 1938.'

"Such a clause raises the question as to whether the mill should accept responsibility for all ingredients as well as their own contribution. If this is done, certificates of compliance should be demanded by you in the case of every purchase. Obviously, all this builds up to a ridiculous situation.

"When the committee from the American Paper and Pulp Association conferred with Mr. Andrews, the question was asked as to responsibility for compliance with the Act in the case of ingredients. Mr. Andrews stated definitely that in so far as the Administrator's office was concerned, each manufacturer would be held responsible for his own manufacturing processes only."

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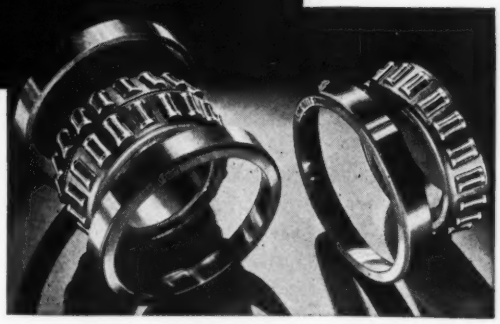

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POWER TRANSMISSION EQUIPMENT

—the line that includes POSITIVE DRIVES

Explanation of the Records Regulation

The Department of Labor has issued the following explanation for the guidance of employers on the regulations issued under the Wages and Hours Act, which went into effect Monday, October 24, for the keeping of employment records:—

Purpose of the Regulations

It is the purpose of Regulations—Part 516—to assist employers in complying with the Act and to assist the Administrator and his designated representatives in securing uniform enforcement of the Act. Every effort has been made to coordinate the record-keeping requirements under this law with those under the Federal Social Security Act, the State unemployment compensation laws and other statutes and thus reduce to a minimum the information required.

Paragraphs (e), (f) and (g) are explanations of information required in Section 516.1 of the Regulations when overtime is worked (over 44 hours per workweek in the year ending October 23, 1939, over 42 hours in the year ending October 23, 1940, and over 40 hours thereafter). When no overtime is worked, this information is not needed.

Form of Records

The sample payroll form on page 2 is submitted merely for explanatory purposes. Required records need not be made or preserved in any particular form so long as they are readily available and contain information from which the information required by Section 516.1 of the Regulations can be easily obtained. The sample form does not provide for recording such information as the worker's home address or date of birth of those under 19. This information will probably be recorded on a separate and permanent record form.

It would be advisable for the employer, as a means of protection, to maintain, in addition to the payroll record, such basic records as those which are recorded by time clocks or time cards, or sheets which include the exact time of starting and stopping the workday and of the time of starting and stopping the meal period.

Explanation of the Items of Information Required in Section 516.1 of the Regulations

Paragraph (a)—Name in full: It is important to have the full name of the worker as a means of personal identification. The name of a worker should therefore be entered as Ruth Ware, not R. Ware; Henry George Rogers, not H. Rogers. Middle names should be recorded. Nicknames should not be used.

Paragraph (b) Home Address: Home addresses should be secured from employees and recorded, and a reasonable effort should be made to keep them up to date.

Paragraph (c)—Date of birth if under 19: The date of birth should be recorded if it appears that the employee is under 19 years of age. Where persons under 19 are employed, an employer should write "minor" or its abbreviation on the payroll before the name of each such person employed.

The Fair Labor Standards Act contains certain prohibitions on child labor, and employers are referred to Sections 3 (e), 12 and 12 (c) of the Act and to the regulations of the Children's Bureau of the U. S. Department of Labor for further information on this matter. Protection against violations of the Act by employing a person under 18 can be secured by holding a certificate issued under regulations of the Chief of the Children's Bureau of the U. S. Department of Labor.

Paragraph (d)—Hours Worked each workday and each workweek: A record of time worked each week must be kept for each employee subject to the Act whether such employee is paid on a time work, piece work, commission, salary, or other basis.

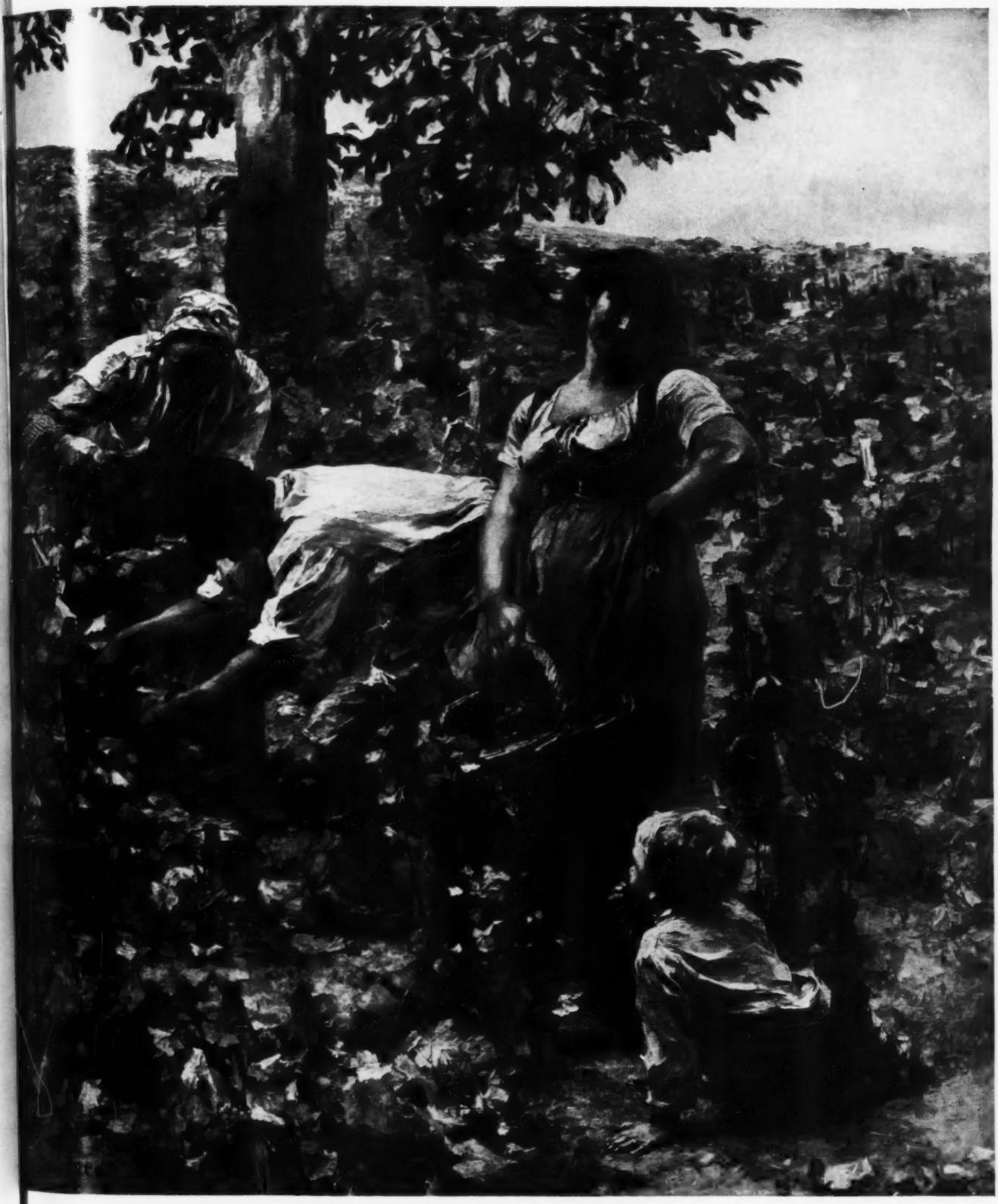
While it is not required that the payroll form show the hours worked each day such a record would have great value in expediting inspection. Where not carried on the payroll the record of hours worked each day must be kept in such form as would permit of immediate use by the inspector should question be raised as to the accuracy of the payroll record on total hours during any one week.

SAMPLE PAYROLL FORM

Workweek ending..... Date of Payment..... (j)

Name (a)	Hours of Work S	M	T	W	T	F	S	Total Hours (d)	Regular Rate of Pay (e)	Wages: Earnings: At Reg. Rate of Pay for Total Hours Worked (f)	Extra for Overtime (g)	Total	Deductions: Soc. Sec. Taxes (h)	Other (itemized) (h)	Cash Wages Paid (i)
1. George Henry Harper.....	—	8	8	8	8	8	8	48	60c per hr.	$28.80	$1.20	$30.00	$ .30	—	$29.70
2. Alfred Olson	—	8	8	8	8	8	8	48	25c per hr. (2.00 per 8-hr. day)	12.00	.50	12.50	.13	—	12.37
3. John White	—	8	8	8	8	8	8	48	50c per hr. (20.00 per wk. of 40 hrs.)	24.00	1.00	25.00	.25	—	24.75
4. Martha Wilson	—	8	8	8	8	8	5	45	50c per hr. (22.00 per wk. of 44 hrs.)	22.50	.25	22.75	.23	—	22.52
5. Henry Hawkins	—	8	8	8	8	8	6	46	52c per hr. (100.00 per mo. on a wk. of 44 hrs.)	23.92	.52	24.44	.24	—	24.20
6. Mary Miller	—	8	8	8	8	8	8	48	25c per hr. (P.W.)	12.00	.50	12.50	.13	—	12.37
7. Helen Marks	—	8	8	8	8	8	—	40	(P. W.)	15.00	...	15.00	.15	—	14.85
8. Janet Barber	—	8	8	8	8	8	8	48	41c per hr. (P.W. plus bonus)	19.68	.82	20.50	.21	—	20.29
9. William J. Anderson.....	—	8	8	8	8	8	8	48	42c per hr. (40c per hr. & P.W.)	20.16	.84	21.00	.21	—	20.79

This sample form has been prepared for the purpose of explaining and illustrating the requirements of Section 516.1 of the Regulations. Employers are not required to keep their records in this form, or in any other particular form, provided that the information required can be easily obtained from their records.



"Vintage" by Leon L'Hermitte

"You Will Harvest Tomorrow What You Plant Today"

THE PUSEY AND JONES CORPORATION, WILMINGTON, DELAWARE

A record must be kept of all time during which employees are required to be on duty or to remain on the premises, or to be at a prescribed workplace with the exception of regular meal periods.

The proper method of computing overtime is described in this explanation under Paragraph (g) below.

Paragraph (e)—Regular rate of pay and basis upon which wages are paid: Where no overtime is worked, no entry need be made for this item.

Where overtime is worked (i.e. where the figure entered in Column (d) prior to October 24, 1939 is more than 44), [1]there should be entered in Column (e) sufficient information to determine the regular rate of pay by which overtime is calculated. The proper entry in this column depends on the basis on which an employee's wage is paid:

For an employee paid solely on an hourly basis, the proper entry is the hourly rate. Example (see line (1) of sample form): "60c per hour".

For an employee paid on a daily, weekly or monthly basis, who is employed for a regular number of hours per week determined by agreement or by the custom maintained in the establishment, the proper entry is the wage rate for the day, week or month, reduced, as shown in the following three examples, to the proper average hourly rate:

EXAMPLES: Worker (2) on the sample form is employed at $2 per day for an 8-hour day and works 6 full days in the workweek. His total weekly wage is $12.00 and his customary hours are 48. His average hourly rate is therefore 25c per hour ($12.00 divided by 48 = 25 cents). The proper entry in Column (e) is therefore: "25c per hour—($2 per 8-hour day)".

Worker (3) on the sample form is employed for $20 per week of 40 hours determined by custom in the establishment in which he is employed. His average hourly rate is therefore 50c per hour ($20.00 divided by 40 = 50 cents). The proper entry in Column (e) is therefore: "50c per hour—($20 per week of 40 hours)".

Worker (5) on the sample form is employed for $100 per month and by union agreement his regular hours per week are 44 hours. His weekly wage is calculated as $23.08 (12 multiplied by $100 divided by 52 = $23.08). The proper entry in Column (e), is therefore "52c per hour—($100 per month on a 44-hour week)".

For an employee paid on any basis other than those mentioned above in this explanation of Paragraph (e) the proper entry is the wage rate for the daily, weekly or monthly employee or the indication that the worker is a piece worker or is paid on some other basis, and in addition, the average hourly rate.

EXAMPLES: Pieceworker (8) on the sample form works 48 hours during the workweek and earns at piece rates, including a production bonus, a total of $19.68. Her average hourly rate is therefore 41c per hour ($19.68 divided by 48 = 41 cents). The proper entry here is therefore "41c per hour = (P. W. plus bonus)".

Paragraph (f)—Wages at regular rate of pay for each workweek exluding extra compensation attributable to the excess of the overtime rate over the regular rate.

Where no overtime is worked, no entry need be made for this item.

This Column (f) includes all wages[2] earned during a workweek for all hours worked but does not include extra earnings attributable to the excess of the overtime rate over the regular rate. For example (see line (1) on sample form, the proper entry in Column (f) for an employee paid 60c per hour for 48 hours work is $28.80 (60c times 48 equals $28.80). This entry includes wages for the 4 hours overtime at the regular rate of pay. Additional overtime compensation for these 4 hours of overtime is calculated separately and entered in Column (g)

The proper entry in Column (f) is computed differently depending upon the basis on which the employee is paid:

For a timeworker paid at an hourly wage rate only, this item is the regular rate of pay multiplied by the number of hours worked in the workweek.

For a timeworker paid at a weekly wage rate, this item is the weekly rate of pay plus a sum for all hours over 44 (computed by multiplying the number of hours worked in excess of 44 by the average hourly rate). (See line (4) on sample form).

For a timeworker paid at a monthly wage rate, this item is computed as follows: The monthly wage is reduced to a weekly wage by multiplying 12 times the monthly rate and dividing the result by 52. This weekly wage plus a sum for overtime computed as in the preceding paragraph, constitutes this item (f). (See line (5) on sample form).

For a pieceworker this item is the amount earned at regular piece rates, including any production bonus. (See line (8) on sample form).

EXAMPLES: Timeworker (1) on the sample form is entered in Column (f) for "$28.80" (60c per hour times 48, the number of hours worked in the workweek).

Timeworker (4) on sample form paid at the regular rate of $22.00 per week, is customarily employed 44 hours per week. Her average hourly earnings are therefore 50 cents per hour ($22.00 divided by 44 equals 50 cents). Since she has worked one hour overtime, her wages at her regular rate of pay for 45 hours are entered in Column (f) as "$22.50" ($22.00 plus 50 cents equals $22.50).

Pieceworker (8) on the sample form is entered in Column (f) for "$19.68" (the amount paid for the number of pieces completed in the 48 hours of the workweek at the regular piece rates, plus a production bonus).

Paragraph (g)—Extra wages for each workweek attributable to the[3] Excess of the overtime over the regular rate. Where no overtime is worked, no entry will appear for this item.

---

[1] Except for 14 weeks in any calendar year in "seasonal industries" as determined in Regulations—Part 536—of the Wage and Hour Division, and where a collective bargaining agreement made by representatives of employees certified as bona fide by the National Labor Relations Board provides that no employee shall be employed more than 1,000 hours during any 26 consecutive weeks or 2,000 hours within a year, in which cases overtime is more than 12 hours per workday and over 56 hours per work week (Section 7(b) of the Act.).

[2] Except those wages specified in Footnote 3 of Section 516.4 (f) of the records regulations:

"(a) bonuses not computed on the basis of measured work performed (e.g. bonuses for punctuality, simple Christmas bonuses, etc.) . . .

"(c) additions to the cash wage for board, lodging or other facilities furnished by the employer."

[3] Interpretative Bulletin No. 4 of the Wage and Hour Division treats in further detail with the provisions for overtime compensation in Section 7 of the Fair Labor Standards Act.

(Continued on page 32)

Michigan Division Superintendents Meet at Kalamazoo

KALAMAZOO, Mich., October 24, 1938—The October meeting of the Michigan Division of the American Pulp and Paper Mill Superintendents Association was held at the Park American Hotel on Thursday evening October 20 at 7 o'clock. This meeting was held jointly with members of the National Metal Trades Association and there were 160 members of both associations present. Chairman Ray L. Barton presided at the meeting and after greeting the members announced that for the November meeting Rice Barton & Fales would show a series of films and a Member of the State Banking Commission would be the speaker.

National President Roy Zellers made a brief address in which he stated that the meeting place for the 1939 convention was Washington, D. C. M. L. Ward the National president of the Metal Trades Association gave a short talk after which the chairman introduced the speaker for the evening Mr. W. E. Odom of William Odom associates whose subject was "The Michigan Unemployment Compensation Act."

In this Mr. Odom was thoroughly at home, being generally conceded an authority on the subject. He explained the working of the act in detail and the information he gave was instructive, interesting, and of true worth to all employers of labor. At the close of his talk he invited those present to ask any question pertaining to the Act, an opportunity it seems all took advantage of.

Those in Attendance

Among those present indentified with the paper industry were the following:

R. L. Zellers National President Superintendent's Asso.; Homer E. Stafford, Retired; E. H. Barnes, Mich. Carton Company; A. W. Coll, Rex Paper Company; Dan T. Quirk, Peninsular Paper Company; J. J. Ely, Peninsular Paper Company; L. W. Dickinson, Mac Sim Bar Paper Company; P. J. Leighty, Mac Sim Bar Paper Company; W. F. Wolfe and C. F. Sisson, Mac Sim Bar Paper Company; M. S. Fogerty, Michigan Paper Company; Ray L. Barton, Chairman Mich. Div.; Paul de Gaehery, C. A. Bragenton, C. J. Kegeler, G. C. Schmid, W. H. Astle and A. E. Hays, Michigan Paper Company; P. H. Gideon, J. De Vines, E. C. Rutz and O. F. Fischer, Bryant Paper Company; W. J. Lawrence, president Bryant Paper Company; W. E. Crotty and R. H. Smith, Bryant Paper Company; Marvin C. Jones, Michigan Carton Company; Myron Flotou, French Paper Company; H. T. Edgar and O. W. Callighan, Edgar Bros. Co.; O. O. Cordes, Downingtown Manufacturing Company; D. D. Bachelder and Arnold Weller, Sutherland Paper Company; Norman J. Cowie, Hawthorne Paper Company; L. H. La Liberte, K. V. P. Company; Al Perlick, Secretary Mich. Div.; R. B. Stewart, K. V. P. Company; Glen Sutton and Al Sherwood, Sutherland Paper Co.; W. S. Taylor American Cyanamid Corporation; A. W. Riedel, Gus Riedel & Son; Walter A. Crawford, Toronto, Ont.; L. J. Lynd, Dilts Machine Works; H. C. Pearson, Pioneer Paper Stock Company; R. W. Holden, Stowe Woodward Inc.; V. Heinmuller, American Cyanamid Corporation; F. K. Shankweler and Robert Buss, Hercules Powder Company; Arthur Stolle, B. L. Brayton, E. G. Milham and L. J. Scheid, Watervliet Paper Company; W. A. Geiger Pulp Div., Weyerhaeuser Company; Harold F. Dewey, Lee Paper Company; L. F. Kretchman and Frederick Frenz, French Paper Company; H. E. Stratton, PAPER TRADE JOURNAL.

Explanation of Records Regulation

(Continued from page 31)

This item is the additional amount of earnings resulting from the extra rate of pay for overtime. This amount should equal at least one-half of the regular hourly rate of pay (or the average hourly rate) multiplied by the number of overtime hours.

EXAMPLE: Timeworker (1) on the sample form is entered for "$1.20" in Column (g) for this item (½ of the regular rate of pay multiplied by the overtime hours; ½ of 60 cents multiplied by 4 equals $1.20).

Pieceworker (8) on the sample form is entered for "$.82" in Column (g) for this item (½ of the average hourly rate multiplied by the overtime hours; ½ of 41 cents multiplied by 4 equals $.82).

Paragraph (h)—Additions to cash wages at cost, or deductions from stipulated wages in the amount deducted or at the cost of the item for which deduction is made, whichever is less. This information is not needed if the cash wage is above the minimum required by the Act. If the cash wage is less than the minimum required by the Act, this entry should show the amount for each item, or the actual cost of each item, whichever is less; and in the case of additions, this entry should show the actual cost of the additions claimed.

Regulations—Part 531—of the Wage and Hour Division define and delimit the reasonable cost of board, lodging and other facilities as part of wages, as required by Sections 3(m) of the Fair Labor Standards Act. Section 3(m) of the Act is further explained in Interpretative Bulletin No. 3 of the Wage and Hour Division.

Paper Stock Business Quiet

BOSTON, Mass., October 24, 1938 — Paperstock dealers and consumers are understood to be at an impasse. There is a tendency on the part of dealers to mark up prices and a resistance to these prices shown by the buyers, so that there is little or no business.

Superintendents To Meet at Washington

Robert L. Eminger, secretary-treasurer of the American Pulp and Paper Mill Superintendents Association announces that the board of trustees has voted to hold the 1939 convention and exposition in the Wardman Park Hotel, Washington, D. C. June 13, 14 and 15 instead of Baltimore, Md. which city was selected at the Toronto meeting.

CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, Financing and Operation of Pulp and Paper Mills

General Construction Notes

Crossett, Ark.—Crossett Paper Mills, manufacturers of kraft paper stocks for wrapping and bag service, etc., has approved plans for an expansion and improvement program at mill, to include four additional buildings, three to be of one-story and other, two-story, 64 x 128 feet. Latter unit will be used for expansion in present finishing mill, including increased storage and distributing facilities; the three one-story extensions will comprise a bleaching unit, oil products recovery mill, and enlargement in power house. The oil mill will develop a by-product made from refuse black liquors resulting from pulp fiber-cooking, used in paint production; this unit will be equipped for large output, which will be shipped in tank cars to different destinations. Bleaching plant, also, will be developed for extensive increased production in this division. Addition to power house will include installation of a new boiler unit, turbo-generator and auxiliary equipment. Contract for erection of buildings has been let to the Rust Engineering Company, Clark Building, Pittsburgh, Pa., and work will be carried out at early date. Program will include extensions and betterments in certain equipment at mill, including facilities for increased raw pulp production, to develop output of about 200 tons per day, and for corresponding increase in paper-making and finishing divisions to convert such rated output into paper and pulp board materials. Pulpwood storage department will be increased in capacity and other yard and yard building improvements made. Entire project will be carried out over a period of months and is estimated to cost about $750,000 with buildings and equipment. Company is a subsidiary of the Crossett Lumber Company, which operates a local mill.

Batavia, N. Y.—The E. N. Rowell Company, Inc., Jefferson avenue, manufacturer of stiff paper boxes for the drug and chemical industries, etc., has plans for new addition to plant, to be one-story, reported to cost about $45,000, with equipment. General contract for building erection has been let to M. E. Colle, LeRoy, N. Y., and work is scheduled to be placed under way at once.

Seaford, Del.—E. I. duPont deNemours & Co., Inc., Rayon Division, duPont Building, Wilmington, Del., manufacturer of cellulose rayon products, has concluded arrangements for purchase of tract of about 340 acres of land on Nanticoke River, about a mile from town limits of Seaford, as site for new mill, recently referred to in these columns. Plans are in progress for the initial buildings and superstructure is scheduled to begin before the close of the year. Plant will comprise several large production units, with power house, pumping station and other mechanical divisions. It will provide facilities for employment of over 1000 persons. Cost estimated close to $7,000,000. Company engineering department, first noted address, is in charge.

Cornell, Wis.—The Cornell Wood Products Company, manufacturer of sulphite board products, wood pulp board specialties, etc., has approved plans for new addition to mill, to be one-story, about 48 x 75 feet, estimated to cost over $40,000, with equipment. It will be used for expansion in wood pulp division. General erection contract has been awarded to the Hoeppner-Bartlett Company, 631 East Madison street, Eau Claire, Wis., and work on superstructure will proceed at early date. Heating, plumbing and electrical work will be carried out by company by day labor.

Brokaw, Wis.—The Wausau Paper Mills Company, manufacturer of bond and other writing papers, is taking preliminary bids to determine cost of proposed new hydroelectric power plant for service at mill, including power dam, generating station of reinforced-concrete, about 60 x 70 feet, and power lines. The dam similarly will be of reinforced-concrete type, about 150 feet long. It is planned to complete detailed plans in near future, when official call will be made for construction and equipment bids. L. A. DeGuere, Wisconsin Rapids, Wis., is consulting engineer.

Pearisburg, Va.—The Celanese Corporation of America, Inc., 180 Madison avenue, New York, N. Y., manufacturer of cellulose rayon products, has authorized work to proceed on proposed new processing mill on site in vicinity of Pearisburg, secured a number of months ago through the Giles County Chamber of Commerce, Narrows, Va., as previously reported in these columns. It consists of a tract of about 1200 acres of land, situated between Pearisburg and Narrows, and arrangements have been concluded with the Virginian Railway to build a line to the site at once. The plant will consist of several large one and multi-story units, with power house, pumping station and machine shop, and is estimated to cost about $5,000,000, with equipment. Immediately on completion of the first unit, company will proceed with the erection of a second plant unit to cost a like amount, making a total initial plant investment of $10,000,000. It is expected to provide facilities for employment to about 1500 operatives at the new mill, which is scheduled for completion late in 1939 or early in 1940. The company recently has

arranged for a bond issue of $20,000,000, a portion of such fund to be used for the construction of mill. W. M. C. Cameron is vice-president in charge of operations.

Wilmington, Del.—The Delaware Paper Products Company, Inc., recently organized, has arranged for lease of space in the local Thomas-Thiel Building, Beech and Anchorage streets, totaling about 5,000 square feet of floor area, and will occupy for new paper-converting plant for the manufacture of paper napkins and allied specialties. Equipment will be installed at once and plant made ready for production. Mark A. Manning is president of new company, and G. F. Jess, secretary and treasurer; Mr. Jess formerly was connected with the Rockland Paper Company, Inc., Rockland, Del.

New Companies

New York, N. Y.—The Millford Paper Products, Inc., has been incorporated with capital of $10,000, to manufacture and deal in paper goods. New company is represented by Dyke & Schraines, 551 Fifth avenue, New York, attorneys.

Springfield, Mass.—The Peratainer Corporation, 145 Chestnut street, has been chartered with capital of 400 shares of stock, no par value, to manufacture machinery for container manufacture of various kinds, including wax unit containers. Elmer L. Schumacher is president and treasurer.

New York, N. Y.—The Berkshire Card Company, Inc., has been organized with 200 shares of stock, no par value, to deal in card and paper stocks of various kinds. New company is represented by Saul Katz, Northcourt Building, White Plains, N. Y.

Cape Vincent Pulpwood Co. Formed

[FROM OUR REGULAR CORRESPONDENT]

DEXTER, N. Y., October 22, 1938—A newly organized concern known as the Cape Vincent Pulpwood Company handled its first shipment of pulpwood by water from Canada to this country early this week as a consignment arrived for the local branch of the St. Regis Paper Company. A crew of forty stevedores started unloading the vessel as soon as it reached Cape Vincent and operations were carried on day and night. The boat was so heavily laden with the pulpwood that it touched bottom as it started to dock at the rail terminal and it was decided to unload at another dock where the water was deeper. The new concern was formed a few weeks ago to handle water shipments to Northern New York mills and further consignments are expected in the near future.

Woodberry Drier Felts

The Turner Halsey Company, 40 Worth street, New York, selling agents for the Mt. Vernon-Woodberry Mills, Inc., has informed the industry that the Woodberry 887 reinforced drier felts is a new contribution to economy in felt costs. The invention is protected under Patent No. 2,115,658, issued April 26, 1938, and is said to be an important forward step in drier felt development.

Experiments covering months of testing in paper mills, the company states, indicate substantial savings on kraft, newsprint, book, tissue, bond tablet and other papers. It is also stated that felts have already been shipped to over fifty leading paper mills.

Government Paper Bids

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., October 26, 1938—The Government Printing Office has received the following bids for 45,500 pounds of dull coated book paper; Paper Corporation of U. S., 6.75 cents; Walker, Goulard Plehn Company, 6.74 cents; Stanford Paper Company, 7.22 and 7.37 cents; Whitaker Paper Company, 6.9 and 7.05 cents; Barton, Duer & Koch Paper Company, 6.8 cents; Mudge Paper Company, 6.74 cents; John F. Post, Inc., 6.79 cents; and Enterprise Paper Company, 6.799 cents less 1 per cent.

For 5,000 pounds of No. 1 gummed kraft paper; Bradner & Smith, 9 cents; Mudge Paper Company, 7.64 cents; Enterprise Paper Company, 7.79 cents less 1 per cent; R. P. Andrews Paper Company, 8 cents; Whitaker Paper Company, 7.87 and 9 cents; Walker, Goulard Plehn Company, 8.5 cents less 2 per cent; Resolute Paper Products Corporation 7.75 cents less 1 per cent; Stanford Paper Company, 8 cents less 2 per cent; Andrews Paper House of York, 7.68 cents; Cauthorne Paper Company, 7.68 cents; Mathers-Lamm Paper Company, 7.8 cents; and Rexford Paper Company, 8.6 cents.

For 1,000 pounds of white stereotype molding paper in 24 inch rolls; Standard Paper Manufacturing Company, 9.95 cents; Cauthorne Paper Company, 11 cents; and Russell Products Company, 14.5 cents.

For 16,991 pounds (217,160 sheets) of 50 per cent rag, blue bond paper; Graham Paper Company, 12.87 cents; Barton, Duer & Koch Paper Company, 11.95 cents; Aetna Paper Company, 11.66 cents; R. P. Andrews Paper Company, 12.23 cents; Stamford Paper Company, 12.25 cents; Mathers-Lamm Paper Company, 17.83 cents; Whitaker Paper Company, 12.87 cents; Mudge Paper Company, 12.73 cents; and Paper Corp. of U. S., 13.26 cents.

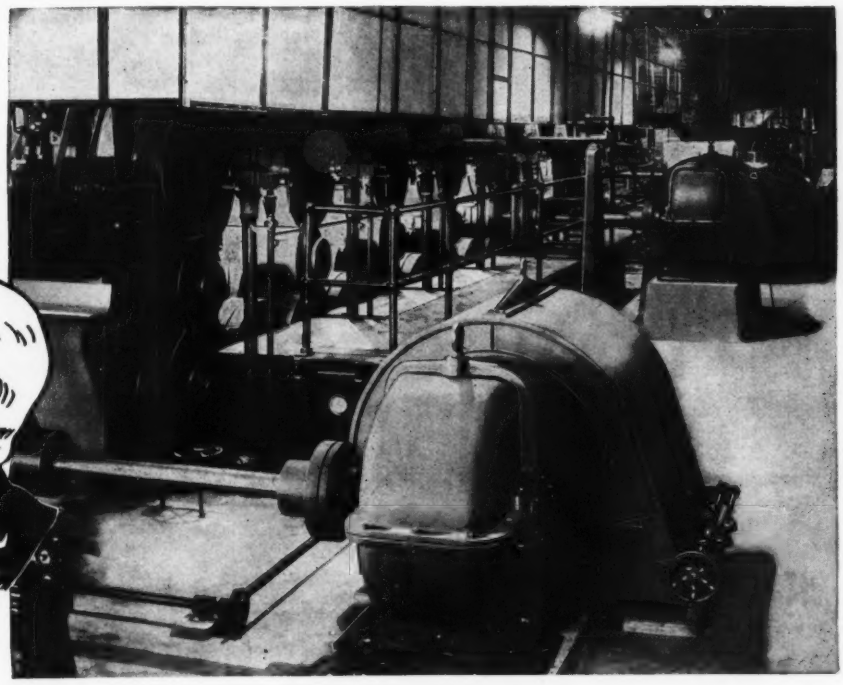
For 36,000 pounds (86,000 sheets) of 21 x 32 manila cardboard; R. P. Andrews Paper Company, 3.75 cents; Stanford Paper Company, 5.4 cents; Mathers-Lamm Paper Company, 3.94 cents; Old Dominion Paper Company, 4.069 cents; and Enterprise Paper Company, 4.04 cents, less 1 per cent.

For 29,100 pounds (150,000 sheets) of 20 x 30 drumhead manila paper; Mudge Paper Company, 14.85 cents; Enterprise Paper Company, 7.283 cents less 2 per cent; and Whitaker Paper Company, 7.59 cents.

For 29,232 pounds (126,000 sheets) of 35 x 45 white coated book paper; Paper Corporation of U. S., 6.725 cents; Mudge Paper Company, 6.3 cents; Whitaker Paper Company, 6.74 and 6.88 cents; Barton, Duer & Koch Paper Company, 6.79 cents; R. P. Andrews Paper Company, 6.3 cents; Marquette Paper Company, 6.74 cents; Stanford Paper Company, 6.3 cents; Walker, Goulard Plehn Company, 6.74 cents; John F. Post, Inc., 6.3 cents; and Butler Company, 6.54 cents.

E. P. Wood, Pulp Testing Chemist

Charles C. Boyce, secretary of the Joint Committee on Approved Pulp Testing Chemists for the Paper Industry, announced that Edward P. Wood, technical director, of the Pulp Division, Weyerhaeuser Timber Company, Longview, Wash., has been accepted by the committee as an approved mill pulp testing chemist, and is listed as such effective October 18, 1938.



A Set of Enclosed Type Spiral Gear Drives Operating on a 176" Tissue Machine

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PAPER TRADE JOURNAL

ESTABLISHED 1872

Reg. U. S. Pat. Off.

George S. Macdonald, Pres. *Joseph P. Horgan, Secy.*

Executive and Editorial Offices, 15 West 47th St., New York, N. Y.

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Washington Correspondent

Per Copy, 10 cents — United States, Per Annum, $4.00
Canada and Foreign Countries in Postal Union, $6.00

Member Audit Bureau of Circulations

Vol. CVII New York, October 27, 1938 No. 17

COMING EVENTS IN THE PAPER INDUSTRY

NEW ENGLAND SECTION. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Nonotuck Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION. Technical Association of the Pulp and Paper Industry—Second Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

WAGES AND HOURS LAW

The Wages and Hours Laws of the Fair Labor Standards Act of 1938 became effective October 24 and with it the Federal Government exercises a measure of political control over interstate industry and trade. It denotes of course, a step in the direction of the regimentation of all national resources to ultimately embrace a controlled economy for the attainment of the social objectives of the New Deal. Thus the Administration has at length succeeded in regaining much of the centralized authority it lost when the Supreme Court declared the NRA unconstitutional in May 1935. It marks the return of compulsory minimum wages and a maximum work week for workers in industry and creates problems which employers must promptly meet now.

When the NRA was inaugurated there followed a rapid rise in production and sales and a substantial increase in prices. It is not expected that the application of the Fair Labor Standards Act will duplicate these spectacular features of the old NRA. The volume of industrial activity was at a lower level in 1932, with prices far below the current level. In 1932, the national income was $39,545,000,000 and the wages of workers in manufacturing industries totaled $6,798,000,000. In 1936 the economic situation had so greatly improved that the national income rose to $63,799,000,000 and the wages of workers in manufacturing industries totaled $11,369,000,000. The price levels of these two periods are dissimilar but the higher taxation scheme of today exerts pressure toward higher production costs and higher prices for manufactured goods. The per capita tax, including Federal, State and local taxes, was $65.19 in 1932, $81.74 in 1936 and the estimate for 1937 is $95.16. The taxes paid by all active corporations in 1932 totaled $2,373,000,000, and aggregated $3,363,000,000 in 1935. The national income in 1937 was $69,817,000,000 and the per cent of taxes of national income produced is estimated at 17.6 per cent. The set-up today and the decline in private spending is due, of course, to the rapid increase in the cost of government due to the policies of the present Administration. What result the current spending plan to regain prosperity will have on production and on prices is problematical. The situation is precarious as the Government continues to spend more and more money for more things, which reverses the long-time economic policy of this country, for prosperity in the past has been built upon a large program of private investment. The wholesale purchasing power of the dollar in the cities of the country for all commodities in 1932 was 1.543; in 1936 it was 1.238. The economic situation now, despite the large number of unemployed and the huge increase in the national debt, has so greatly changed that this year is scarcely incomparable with the boom years of the NRA.

In the paper industry, fortunately, the minimum wage requirement of the Act creates no problem. The maximum work week of 44 hours with overtime figured at the rate of time and one-half will require some adjustment of production schedules and also a modification of keeping employee records in some mills. Although the Act will necessarily add something to the costs of doing business, it is expected by the proponents of the Act that the new law will tend to increase employment, increase the working income of low-wage groups and increase the stability of factory workers in general.

In sending a copy of the Wage and Hour Division of the Fair Labor Standards Act to paper and pulp manufacturers on October 19, Charles W. Boyce, executive Secretary of the American Paper and Pulp Association pointed out: "These rules, regulations and interpretations apply to the Act when it goes into effect on October 24, 1938. On that date, it must be borne in mind, the Act becomes effective. Undoubtedly rules, regulations and interpretations will be issued after that date, some of which may modify the regulations of some of the provisions of the Act. In order that all difficulty may be avoided, the Act should be complied with literally, except as modified through these administrative rulings."

The only business enterprises which are exempt under the Act are those classified as purely local in scope. All engaged in interstate business come within the law. It is pointed out by officials that the Act is self-policing and that violations will cause the employer much trouble. For example, any employee working longer than maximum hours or paid less than the minimum wage, can bring suit to recover double the amount of unpaid minimum wages and double the amount of unpaid overtime compensation. The employer also will be required to pay attorney's fees and costs of the court.

According to a ruling by Elmer F. Andrews, Administrator of the Act, clerks, stenographers, watchmen and messengers employed by industries within the scope of the new law must be included within its terms, even though their occupations may not appear directly to have any relationship to interstate commerce. Mr. Andrews also ruled that the employment of learners, apprentices, handicapped persons and messengers at lower than minimum wages will be allowed only under special certificates issued by the Administrator. In Section 541.4 relating to outside salesmen the Act reads: "The term 'employee employed . . . in the capacity of outside salesmen' in Section 13 (a) (1) of the Act shall mean any employee who customarily and regularly performs his work away from his employer's place or places of business, who is customarily and regularly engaged in making sales as defined in Section 3 (k) of the Act and who does no substantial amount of work of the same nature as that performed by non-exempt employees of the employer. For the purpose of this definition, recurrent routine deliveries, whether or not prior orders are placed by the purchaser, and collections, shall not be considered sales."

Thomas M. Cook Writes from Peru

[FROM OUR REGULAR CORRESPONDENT]

POTSDAM, N. Y., October 22, 1938—Thomas M. Cook, formerly chemist at the Racquette River Paper Company, has written friends here that rapid progress is being made in the establishment of the papermaking industry in South America. He left here last spring to enter the employ of the W. R. Grace & Co. which is carrying on extensive work in Peru. He is doing chemical research on sugar cane fiber prior to the construction of a large paper mill. Mr. Cook is a graduate of the forestry division at Syracuse University. In his letter he relates that the past summer and early fall have been devoted to preliminary developments for the mill in which plans call for the installation of a 110-inch machine capable of producing about 25 tons of paper daily. He also stated that he has completed the installation of the laboratory and is now working on the bagasse fiber and any other fiber available that he can obtain, in fact anything that looks as though it may be used in manufacture of paper. In concluding he refers to the weather in that country and also mentions the living conditions.

Production Ratio Report

The statistics are based upon paper production reports to the American Paper and Pulp Association.

COMPARATIVE MONTHLY SUMMARIES

Months	1938(c)	1937(c)	1936	1935	1934
January	63.9%	90.3%	76.1%	65.8%	.....
February	68.7%	90.1%	77.9%	70.0%	.....
March	69.6%	90.3%	76.0%	70.5%	.....
April	68.3%	92.1%	82.3%	70.0%	.....
May	69.0%	90.6%	81.6%	69.4%	.....
June	66.0%	87.3%	80.7%	72.3%	.....
July	72.0%	81.8%	77.3%	64.9%	.....
August	77.2%	82.9%	81.5%	70.9%	.....
September	76.2%	78.6%	80.5%	71.9%	58.2%
October	.....	73.5%	87.6%	75.6%	64.7%
November	.....	61.9%	88.0%	75.3%	61.7%
December	.....	64.5%	85.9%	71.2%	59.6%
Year Average	.....	80.6%	81.3%	70.5%	.....
First 41 weeks	70.6%	86.3%	79.8%	69.7%	.....

COMPARATIVE WEEKLY SUMMARIES

CURRENT WEEKS, 1938		CORRESPONDING WEEKS, 1937	
*September 10	66.0%	September 11	68.7%
*September 17	79.6%	September 18	82.7%
*September 24	78.5%	September 25	81.9%
*October 1	81.0%	October 2	79.1%
*October 8	81.2%	October 9	77.0%
*October 15	83.0%	October 16	74.8%

The following statistics show the number of mills reporting by ratio groups:

	Number of Mills Reporting, Current Weeks					
Ratio Limits	Sept. 10, 1938	Sept. 17, 1938	Sept. 24, 1938	Oct. 1, 1938	Oct. 8, 1938	Oct. 15, 1938
0% to 50%	92	74	110	71	55	46
51% to 100%	216	233	196	231	240	158
Total Mills Reporting	308	307	306	302	295	204

* Subject to revision until all reports are received.
(c) Basic capacity data have been adjusted to correspond with ratings reported by individual companies.

PAPERBOARD OPERATING RATIOS

According to reports from the National Paperboard Association, per cents of operation, based on "Inch-Hours", were as follows:

Mos.	1938 (e)	1937 (e)	1936	1935	Mos.	1938 (e)	1937 (e)	1936	1935
Jan.	55%	80%	61%	61%	July	57%	67%	69%	59%
Feb.	61%	86%	67%	67%	Aug.	66%	74%	75%	65%
Mar.	60%	87%	68%	67%	Sept.	66%	70%	76%	69%
Apr.	57%	89%	70%	61%	Oct.	....	66%	82%	76%
May	58%	86%	68%	61%	Nov.	....	56%	79%	70%
June	56%	75%	68%	65%	Dec.	....	46%	74%	60%

Week end. Sept. 10, 1938—57%
Week end. Sept. 17, 1938—71%
Week end. Sept. 24, 1938—68%
Week end. Oct. 1, 1938—69%
Week end. Oct. 8, 1938—70%
Week end. Oct. 15, 1938—70%

(e) Basic figures revised to include new members of the National Paperboard Assn.

Paperboard Association To Meet

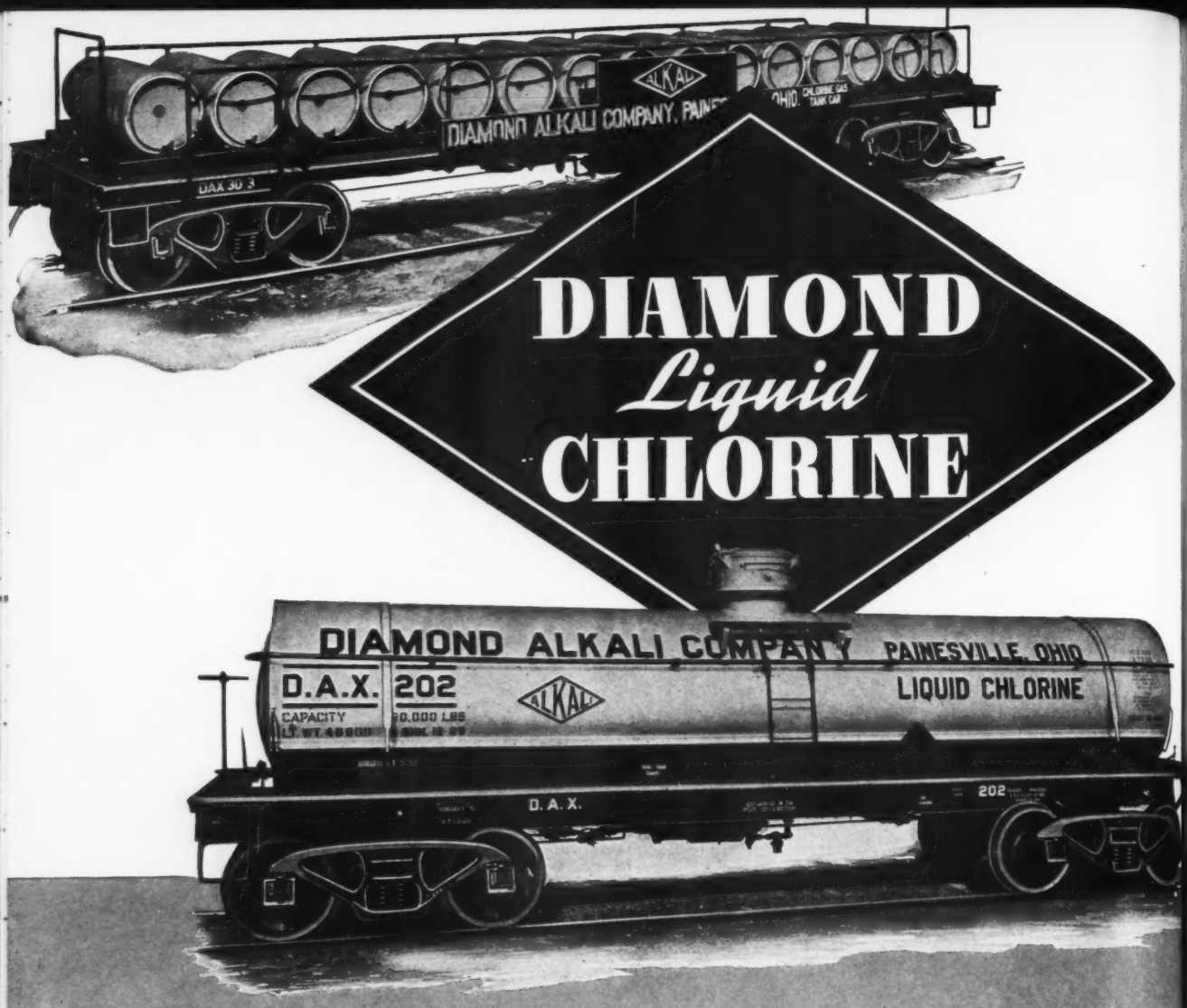
The National Paperboard Association will hold its annual meeting in the Waldorf-Astoria Hotel, November 16 and 17.

This meeting is called for the election of officers for the ensuing year, for taking such action as is specified in the By-Laws of the Association, and for transacting such other business as may come before the meeting.

A meeting of the new Board of Directors will be called to be held at about 5:00 P.M., Wednesday, November 16, report of which will be submitted at the session on Thursday morning.

An interesting program is being prepared, which will include a report by President Henry D. Schmidt, reviewing "Association Activities." Reports will also be submitted by Vice-President S. M. Phelan, Jr., and by others.

Important subjects are to be considered, including a program of activities for the ensuing year. All members are urged to attend and participate actively.



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Section of the
Technical Association of the Pulp and Paper Industry

Edited by Ronald G. Macdonald, Secretary

Review Of The Paper Industry Literature

Abstracts Compiled By the Abstracts and Bibliography Committee of the Technical Association of the Pulp and Paper Industry, A. Papineau-Couture, John F. Ohlson, C. E. Peterson and Clarence J. West, Chairman.

Copies of United States Patents can be obtained from the United States Patent Office, Washington, D. C. for 10 cents each. Send currency, not stamps.

Pulp Purification

Treatment of Kraft Pulp for the Production of Parchment or Glassine Paper. Walter Roy Weeks. Fr. pat. 821,061.—Kraft pulp is treated at up to 100°C, with an alkali and alkaline-earth solution or suspension up to but not exceeding 7 per cent on the weight of dry fiber.—A.P.-C.

Highly Purified Cellulose for Rayon and Explosives. S. A. Manifattura di Altessano. Belg. pat. 423,057 (Sept. 30, 1937).—The pulp is treated successively with an acid, an alkali, an oxidizing agent in acid medium, an alkali and an oxidizing agent in alkaline medium. The first two treatments are carried out in presence of substances which protect the cellulose against harmful secondary reactions of the chemicals.—A.P.-C.

Refining Wood Pulp. A. H. Stevens, assignee of Canadian International Paper Co. Brit. pat. 468,306 (May 9, 1936).—Bleached or unbleached pulp is treated at high density (e.g., 30 per cent) with a small excess of free sodium hydroxide (pH usually 8 to 9) and a wetting agent (sulphonated oils and alcohols). The treatment is carried out at 65° to 75°C. for about 3 hrs., when the pulp is washed free from reaction products. Resins and residual coloring matter are thereby removed.—A.P.-C.

Process for the Manufacture of a Highly Refined Pentosane-free Pulp. I. G. Farbenindustrie A.G. Frankfurt a.M. Ger. pat. 646,819 (Aug. 18, 1935); Addition to Ger. pat. 539,938. The starting product is mercerized at room temperature with a 15 to 25 per cent solution of caustic soda and converted over to alkali cellulose and then treated with a dilute solution of caustic soda also at room temperature. The excess liquor removed by centrifuging or pressing, and the material cooked with or without pressure, with the result that a pentosane-free pulp is obtained with 98 to 99 per cent alpha.—J.F.O.

Process for the Recovery of Pentosane from Plant Parts Which Have Considerable Pentosane Holzhydrolyse A. G., Heidelberg. Ger. pat. 647,913 (Aug. 28, 1931).—A quick action without attacking the pentosane dissolved out is obtained by treating beech wood, bagasse, etc., with a thirty per cent solution of sulphuric acid at 95°C for from 15 to 50 minutes.—J.F.O.

Pulp and Paper Testing

Annual Progress Report of Tappi Paper Testing Committee, 1937-1938. B. W. Scribner. Paper Trade J. 106, No. 12: 45-46 (March 24, 1938).—An outline of the work carried out during the past year.—A.P.-C.

Influence of Atmospheric Humidity and Temperature on the Moisture Content of Paper Board. R. K. Ulm. Paper Trade J. 106, No. 8:108-116 (Feb. 24, 1938).—Excluding the phenomenon of hysteresis, the moisture content of a piece of board is determined by fixing any two of the three variables: temperature, absolute humidity and relative humidity; the specification of only one of these variables is insufficient to determine the moisture content.—A.P.-C.

The Acidity of Paper. Donald Burton. Analyst 6:19-27 (Jan., 1938).—Over 100 years' study of the deterioration of leather has shown that the deterioration is usually caused by the acidity of the sample. The same probably is true of paper. Methods for determining the total acid content of paper, the pH of the aqueous extract and the actual pH of the paper are discussed. Values obtained with various typical papers are given.—A.P.-C.

Determining the Amount of Incrustants in Pulp. Anon. Papeterie 59:1149-1150 (Dec. 25, 1937).—A brief description of the method of determining the permanganate number of chemical pulp and of calculating therefrom the amount of bleach required.—A.P.-C.

Concerning the Determination of the Degree of Decomposition of Sulphite Pulp. Kurt Schwabe and Heinz Fiedler. Wochbl. Papierfabr. 68: No. 48, 912-16; No. 51: 1002-04; No. 52: 1024-27, Nov. 27, Dec. 18, 25, 1937); 69, No. 1: 5-7; No. 3: 51-53 (Jan. 1, 15, 1938).—Methods for the determination of lignin are briefly described. The action of potassium ferricyanide on pulp for the determination of lignin, that is, the degree of decomposition is studied. Experiments to titrate potentiometrically the lignin in the pulp with potassium ferricyanide and the working out of a new method for the determination of the degree of decomposition by oxydation of the lignin

with potassium ferricyanide. The factors studied are, titration of the potassium ferrocyanides formed by the reduction of potassium ferricyanide, investigation of the action of other influences on the ferricyanide consumption of the lignin in the pulp, influence of time, alkali concentration, ferricyanide concentration, temperature, and degree of diminution of the pulp. Determination of the conditions for a new method. The use of the potentiometric titration for the benzidine method of W. Nippe. Comparison of the potassium ferricyanide method with the Johnsen-Noll, Sieber and amine number according to Nippe as well as the standard method for the determination of lignin. Checking results and sources of error of the methods investigated for the determination of the degree of cooking. In conclusion the authors summarize the important facts gleaned from the entire article.—J.F.O.

Problem of Practical Gloss Measurements. H. Wolff and G. Zeidler. Paint Var. Prod. Man. 17, No. 4:7-13 (1937).—Experiments with photographic papers (providing black, grey and white surfaces of various degrees of gloss) indicate that there is a close correlation between subjective gloss and the difference between the specular and diffuse reflectivities. The correlation persists, but is less close, in the case of colored papers, whilst anomalous results are obtained in the case of metallic foils.—A.P.-C.

Laboratory Methods for Measuring the Printing Quality of Paper. G. L. Larocque. Pulp Paper Mag. Can. 39:99-105, 123 (Feb., 1938).—A description is given of a laboratory method for comparing and evaluating the printing quality of sheets of paper by printing them with a hand-operated letter-press under controlled conditions of ink coverage and pressure. The amount of ink on the form and the per cent transferred to the paper are determined directly, by weighting a special 25-g. 10x10-cm. steel plate before and after printing; the amount of ink transferred to the paper is proportional to the amount of ink on the printing form and increases with the printing pressure, the smoothness and the softness of the sheet.—A.P.-C.

Dirt in Sulphite Papers. W. A. Ketchen. Pulp Paper Mag. Can. 39:130-132, 1937, Feb., 1938).—An analysis and discussion of statistical data collected during the past 8 years at the paper mill of Fraser Companies, Ltd. The importance of control of the cooking acid within narrow limits for any one condition is emphasized as a factor that affects cleanliness, bleach consumption and quality of the finished pulp.—A.P.-C.

Digester Blowdown Condensing Systems*

Recovery of Heat and Turpentine from Digester Relief

By Pell W. Foster Jr.,[1]

Abstract

This article first points out that over 50 per cent of the heat required in a digester cook can be recovered from the steam flashed off the digester during the blow. It then goes on to discuss various systems for recovering this heat, both in the form of hot water and also in the form of low pressure steam.

One of the large heating requirements in a pulp mill is the cooking of the pulp in the digesters. Assuming that the mill has a ten ton digester, 36 million B.t.u. or 42,000 pounds of steam at 150 pounds gage pressure are required just to bring the digester and its content up to a temperature of 340 deg. F. To this must be added the heat supplied during the cooking period, which may be assumed to be about 1,800,000 B.t.u. per hour allowing both for radiation and for relief losses. Assuming a 1½ hour cook the total heat input would be 38,700,000 B.t.u.

When a digester is blown down into a diffuser the pressure drops to atmospheric and the temperature of the mixture of pulp and liquor immediately drops from 340 to 212 deg. F. releasing the sensible heat proportional to the temperature drop and causing this heat to flash off in the form of steam. Again using the ten ton digester as an example, the heat released in the steam flashed off amounts to 23 million B.t.u. If this can be recovered and used it is apparent that the cost of heat supplied to the digesters can be materially reduced. Because of the large possible savings, practically all the new mills that have been built within the last couple of years have put in equipment to recover this heat.

Figs 1 and 2 give a convenient and quick method of determining the approximate amount of steam flashed off from any digester. Fig. 1 gives the water equivalent of the weight of the digester liquor and pulp per cubic foot of digester volume. If this figure is multiplied by the volume of the digester in cubic feet the resultant is the water equivalent weight of the digester. With this figure, and having determined the pressure at which blowdown will occur, the thousands of pounds of steam flashed off can be read from Fig. 2.

System for Blowdown Heat Recovery

There are several different systems that may be

* Presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Waldorf-Astoria Hotel, New York, N. Y., Feb. 21-24, 1938.

[1] Manager, Industrial Division, Foster Wheeler Corp., New York, N. Y.

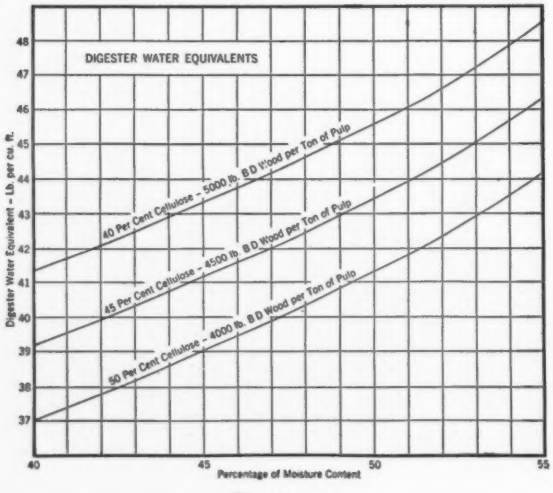

FIG. 1.

used to condense the steam and recover the heat. The most simple one from the point of view of amount of equipment required is the one using a surface type condenser.

SURFACE TYPE CONDENSER:

The arrangement using a surface condenser is shown in Fig. 3. The design of condenser is specially developed for this duty, as shown. The steam is brought in at the bottom and then expands in a large distributing dome so as to enter the nest of condensing tubes at a low velocity. The low velocity at which the steam enters the tubes, plus the rain of condensate tends to knock down any entrained pulp particles, and serves to minimize any chance of pulp being carried up into the tube handle.

The tube bundle is made up with open lanes extending well within it, and cleanout openings are placed opposite these lanes so that the whole bundle may be hosed down in case any pulp should reach the tubes. The amount of water supplied to the condenser is thermostatically controlled, not only to admit sufficient water to give complete condensation of the steam, but also to give constant outlet water temperature from the condenser. The non-condensible gas is vented from the top of the condenser either to atmosphere or to a disposal system.

As shown on the flow arrangement, it is advisable to have a cyclone pulp separator in the line between the diffuser and the condenser so as to keep the pulp carried over to the condenser at a minimum.

JET CONDENSER SYSTEM:

The jet condenser system for recovering heat from digester blow-down is shown in Fig. 5. Steam from the digester enters the bottom of the jet condenser, ordinarily placed above the accumulator or storage tank, and the steam rises over a series of horizontal distributing plates and is condensed by water entering at the top and flowing down, counter current to the rising steam. The mixed cooling water and condensate falls, evenly distributed, into the accumulator tank below. Non-condensible gases escape from the top of the condenser, either to the atmosphere or to a closed system if they are to be burned. Due to the counter current design of the condenser, the non-condensible gases are cooled to within a few degrees of the temperature of the entering, or coldest water, thus reducing the entrained water vapor to a minimum temperature. This is most desirable if the gases are to be burned or recovered.

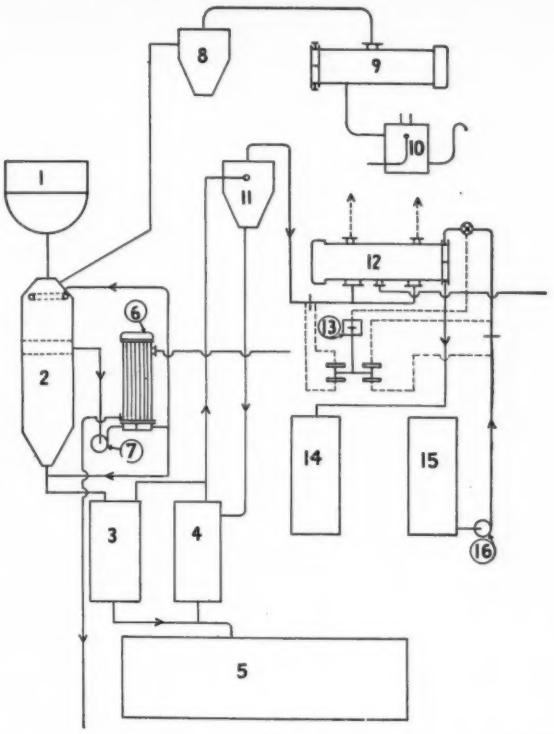

FIG. 3.

Surface condenser arrangement for recovering the heat in digester blowdown, showing indirect heating of digester. 1. Chip Bunker. 2. Digester. 3. & 4. Diffusers. 5. Washed Stock Tank. 6. Indirect Liquor Heater. 7. Liquor Circulating Pump. 8. Cyclone Separator. 9. Turpentine or Relief Condenser. 10. Turpentine Separator. 11. Cyclone Separator. 12. Surface Type Blowdown Condenser. 13. Double Differential Water Proportioning Control Valve. 14. Hot Water Storage Tank. 15. Cold Water Storage Tank. 16. Condenser Circulating Pump.

The hot water from the top of the accumulator tank is drawn off into the first stage of the flash system. This stage is under a vacuum of about 20.12 inches, Hg. which corresponds to a vapor temperature of 161 deg. F. The hot water is cooled by flashing off steam which rises and is condensed in the flash condenser placed at the upper part of the first stage flash chamber. The cooled water from this stage flows by gravity to the second stage of the flash system which is under a vacuum of 26.65 inches, Hg. corresponding to a vapor temperature of 120 deg. F. The water is reflashed and the steam is condensed

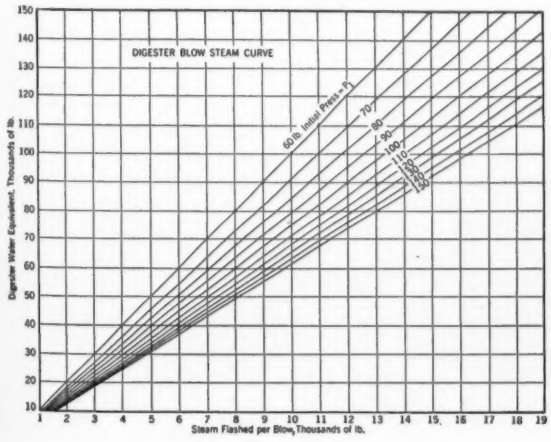

FIG. 2.

FIG. 4.

Shop view of standard surface condenser for blowdown heat recovery.

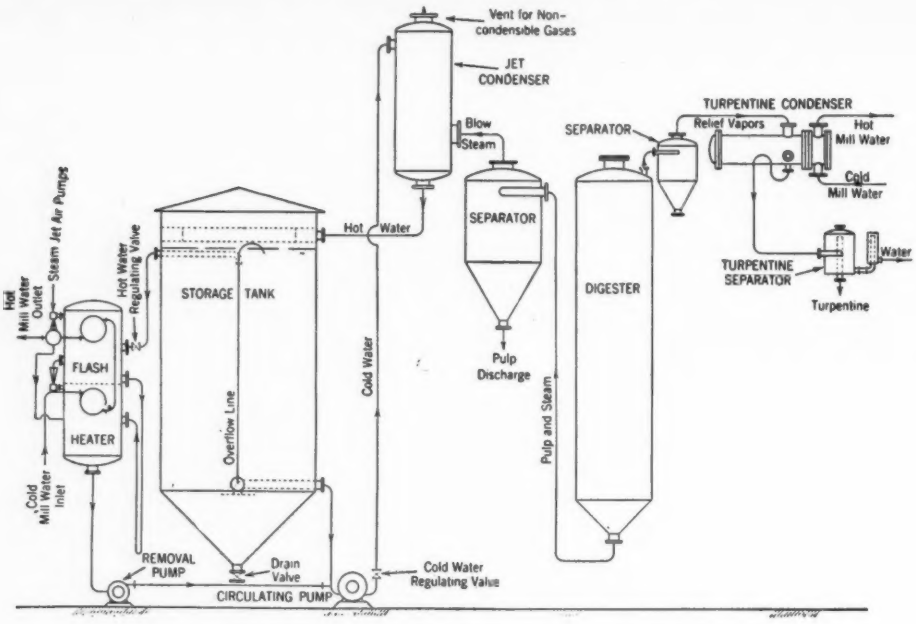

FIG. 5.

Typical jet condenser recovery system for digester blowdown, in combination with turpentine condenser and recovery system.

in a condenser placed at the upper part of the flash chamber.

The cooled water is then removed by means of a pump and delivered to the suction side of the condenser circulating water pump where it is either pumped to the jet condenser, if a digester blow is occurring, or is stored in the bottom of the tank. The mill water being heated passes first through the second stage condenser and then to the first stage condenser.

The flow of water to the jet condenser is thermostatically controlled during a blow, the water being proportioned to hold a constant water temperature leaving the condenser. The initial flow of water to the condenser at the start of a blow is controlled by a thermostatic connection in the condenser vent, which will hold the valve closed until steam reaches the connection. The flow of hot water from the accumulator tank to the flash system is also thermostatically controlled to maintain a constant outlet mill water temperature from the first stage.

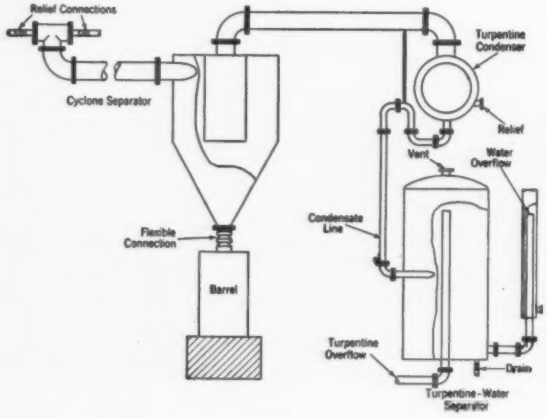

FIG. 6.

More than one jet condenser may be installed in connection with one accumulator tank and flash heating system. For example, with ten digesters, five jet condensers might be installed, each one serving two digesters. The combined condensate and cooling water from each one could be piped to a header which in turn would be connected to the one accumulator tank.

Where a jet condenser is used, the problem is one of transferring heat from a hot, dirty condensate which may contain pulp, to mill water. The ordinary method would be to make this transfer in a conventional shell and tube type, or plate type, heat exchanger. This, however, is liable to lead to trouble from clogging up the exchanger with pulp, even though a separator is used. By flashing off the heat from the hot condensate into steam and transferring this heat through this clean medium, the possibility of clogging up is eliminated. Systems similar to this are already in operation in pulp mills.

Turpentine Condenser

The pulp of many woods used in the manufacture of paper, contains resinous materials and turpentine. When this pulp is cooked in digesters, the turpentine is vaporized by the action of the liquor and the heat in the process. Then, when the pressure in the digester is relieved, the mixture of steam and turpentine vapors may be withdrawn and condensed. This mixture is valuable both for the latent heat in the steam, which can be recovered, and for the raw turpentine which has definite commercial value.

The recovery is accomplished by passing the mixed vapors first through a cyclone separator where most of the entrained pulp particles are removed, then into a special surface condenser. The velocity of the entering vapor is reduced in an expanding nozzle or in a vapor belt, depending on whether the unit is horizontal or vertical. Cooling water makes four passes while circulating counter current to the flow

of the vapors, absorbs the heat in the vapors and goes on into the mill to be used wherever hot water is needed. Non-condensible gases are vented to the atmosphere through an opening in the shell just above the condensate outlet. The condensed vapors after passing through a loop seal are drawn off to a separating system where the water is removed from the turpentine.

The flow arrangement of such a system is shown in Fig. 6.

If, for example, the pressure of an 8-ton digester is relieved from 110 to 100 pounds, there is a heat loss in steam of 900,000 B.t.u. that can be recovered. It has been found in practice that 1½ to 2 gallons of turpentine can also be recovered from each ton of pulp produced. Valuing the turpentine conservatively at 25 cents per gallon, a pulp mill of only 100 tons per day capacity might well recover 150 gallons of turpentine per day having a sales value of $37.50, which would easily pay for the complete turpentine recovery installation within six months. Fig. 7 shows an actual installation of a turpentine condenser in a western pulp and paper mill. In the foreground the bottom of the cyclone separator is shown and the line bringing the steam from the separator to the condenser.

Generating Low Pressure Steam from Digester Blowdown

A few mills have so much hot water from other sources that they cannot use the heat recovered from the digester blowdown in the form of hot water. They could, however, use additional steam at say 25 pounds pressure on the paper machines or on the black liquor evaporators. A certain amount of the heat lost in the blowdown is at sufficient temperature head to be recovered in the form of 25 pounds gage steam by the use of a Ruths Accumulator. Three different arrangements of such a recovery system are shown in Fig. 8.

In Scheme No. 1 before the digester is blown down to the diffusers in the orthodox manner, a preliminary blow is made from the top of the digester, the pressure being relieved from say 110 to 50 pounds gage. The steam flashed off passes through a cyclone separator and then on to a combined condenser and heat exchanger. The condensing water in this unit

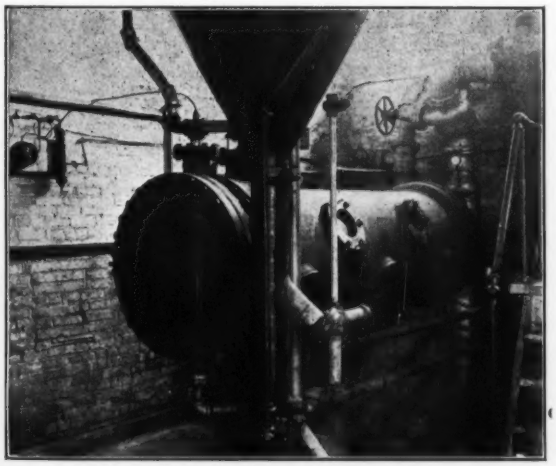

FIG. 7.
Horizontal turpentine condenser installation in pulp mill of Nekoosa Edwards Paper Company, Port Edwards, Wis. In the foreground may be seen the bottom of a cyclone separator.

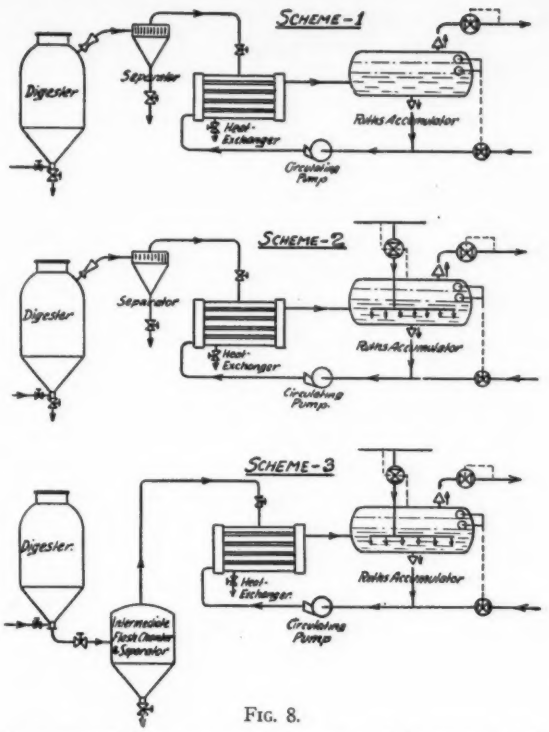

FIG. 8.

is pumped from an accumulator and is heated sufficiently in the tubes of the condenser so that steam at 25 pounds gage pressure can be generated in the accumulator.

Scheme No. 2 shows an additional charging line to the accumulator taking steam from one of the bleed points on the turbine. With this arrangement the accumulator not only recovers heat from the blowdown but also serves to smooth out inequalities between the demand for power and process steam from the entire mill.

Scheme No. 3 contemplates taking the preliminary blow from the bottom of the digester to an intermittent flash chamber and separator. This tank as well as the cyclone separator in Schemes 1 and 2 must be designed for the maximum pressure on the digester.

Such a system as this would recover about 40 per cent of the blowdown loss in the form of steam at 25 pounds gage pressure. This system could also be used during the relief of the digester, transferring the heat recovered into steam at 25 pounds gage pressure. The condensed turpentine could also be recovered by collecting the condensate in the turpentine-water separator.

Using this system on the blowdown has the advantage of giving clean steam at 25 pounds pressure. However, the heat between the temperature corresponding to 50 pounds gage pressure, i. e. 298 and 212 deg. F. cannot be recovered with this type of recovery unit. This heat, however, could still be recovered in the form of hot water and it would be possible to use the same heat exchanger-condenser for this purpose during the final blowdown. If this were done the accumulator system would be shut off and water from the ordinary mill supply would be used as the condensing medium. In the case of any one of these three schemes the digester finally blows down at 50 pounds pressure to a diffuser.

The Fundamentals of Glassine Transparency*

Part II. Instrumental Studies

By Dan B. Wicker[1]

Abstract

In this, the second of a series of three papers on glassine transparency, the results of an instrumental study are presented. An experimental photometric device for measuring the optical properties pertinent to the subject is described and the method of calculating and interpreting the results are discussed. Based upon observations made by several instruments and correlations with visual rankings of a group of transparent sheets, it is shown that transparency ratio and diffuse transmission ratio indicate both the clarity of resolution of an image and the reduction in contrast when a sheet is being seen through. These two ratios become more sensitive to differences in quality as sheets become more transparent. Contrast ratio and per cent contrast visibility indicate the reduction in contrast effected by a covering sheet and become more sensitive to differences in quality as sheets become less transparent. It is concluded that there exists an empirical linear relationship between total transmittance and contrast ratio values for sheets of approximately the same absorptive properties. Reference is made to a transparency meter which has been designed to employ the principles developed in the course of this study.

The first part of this series (*1*) described a group of transparent sheets including cellophanes, glassines, and supercalendered waxing papers. A visual and photographic ranking of the group was given and the concept of transparency was discussed in terms of the visual response resulting from certain optical properties of transparent sheets. Herein will be presented the results of an instrumental study of these samples and the apparent relationships between subjective observations and objective measurements, as well as those between various instrumentally measured properties, will be discussed.

Definition of Terms

In the discussions pertinent to this study, certain objective concepts have been assigned terms which are best defined at this point in order to avoid confusion.

Total Transmittance refers to the capacity of a sheet for transmitting rays of light. Quantitatively, it is the sum of diffuse and parallel transmittance values.

Parallel Transmittance refers to the capacity for transmitting rays of light without their being scattered.

Diffuse Transmittance refers to the capacity for transmitting rays of light in such a manner that they are scattered.

Total Reflectance refers to the capacity of a sheet for throwing back rays of light from an illuminated surface. Quantitatively, it is the sum of the specular and diffuse reflectance values.

Specular Reflectance refers to the capacity for reflecting rays of light in the same perpendicular plane as that of incidence, and with the same angles of incidence and reflection between the rays and a line normal to the sheet surface.

Diffuse Reflectance, as used herein, refers to the capacity of a single sheet (not a stack of sheets) for reflecting rays of light in all directions other than that by which specular reflectance is defined.

Reflectance Over Black and Over White refer, respectively, to the diffuse reflectance of a single sheet when observed over a black or white surface; numerical values of these properties are affected, of course, by the reflectance characteristics of the backing surface. For an ideal black, reflectance over black becomes identical with diffuse reflectance.

Absorption refers to the capacity of a sheet for converting radiant energy of the visible band into other forms of energy.

Transparency Ratio refers to the ratio between parallel transmittance and total transmittance; it is usually expressed on a percentage basis. (Transparency ratio has been defined and discussed by the staff of The Institute of Paper Chemistry (*2*).)

Diffuse Transmission Ratio refers to the ratio between diffuse transmittance and total transmittance; it also is usually expressed upon a percentage basis.

Contrast Ratio refers to the ratio between reflectance over black and reflectance over white.

Per Cent Contrast Visibility refers to the contrast between light and dark zones of a black and white surface covered by a transparent sheet, when expressed as a percentage of the contrast without the covering sheet. Each contrast is expressed as the logarithm of the ratio between the reflectances of the dark and light zones.

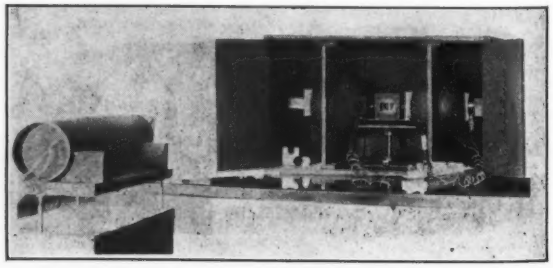

FIG. 1.

* Presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Waldorf-Astoria Hotel, New York City, Feb. 21-24, 1938.

A portion of a thesis submitted in partial fulfillment of the requirements of The Institute of Paper Chemistry for the Degree of Doctor of Philosophy from Lawrence College, Appleton, Wis., June, 1935.

[1] Member TAPPI. Associate Professor of Chemical Engineering, North Carolina State College of Agriculture & Engineering, Raleigh, N. C.

All of the foregoing terms are definitive by nature and their numerical values for a given sample will depend, in part, on the design of the measuring instrument. Such is the case for practically all optical properties dealt with in the field of paper technology.

Description of the Photometric Device

Figs. 1, 2, and 3 illustrate an experimental photometric device which was designed for the particular purpose of measuring the various optical properties related to the transparency of glassine paper. It consists of two major parts, a projector which gives a parallel beam of light and a cabinet containing prism reflectors, integrating spheres, sample holders, and photocells. The projector, which appears in the left foreground of Fig. 1, contains an automotive head light bulb supplied by an ordinary six volt battery. The bulb is capable of lateral and transverse movements for adjustments of focus and the projector as a whole is capable of adjustment of both plane and level. A collimator lens in the end of the tube renders a parallel beam which is directed toward the cabinet.

The cabinet consists of a plywood box holding two spheres, each ten inches in diameter. Referring to the drawing in Fig. 2, the sphere on the left has an interior surface of magnesium carbonate fixed with rubber cement. The measured diffuse reflectance of this surface is 93 per cent. The interior surface of the sphere on the right is covered with Glidden Japalac flat black and has a measured diffuse reflectance of one per cent. Between the two spheres is a small metal box supporting two 45 degree right angle prism reflectors. The box is capable of adjustment for plane, level, center, and alignment. The prism reflectors are in a position to divide the parallel beam impinging upon them from the front and send an equal portion through one and one eighth inch circular openings into each sphere. Diametrically opposite are similar openings which, unless covered, permit the parallel beams to pass through and out of the spheres.

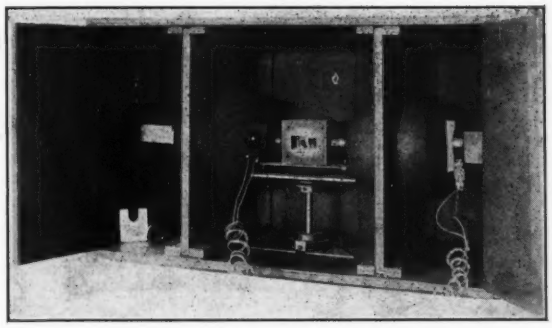

FIG. 3.

The white sphere has a holder for maintaining samples or standards in a position normal to the path of the beam such that light energy may be reflected to the interior surface of the integrating sphere. Over a third opening is a photocell so placed that it is at an angle of 45 degrees with the path of the beam. Fig. 1 shows the cell in place and a paper sample in the holder at the extreme left of the cabinet. Fig. 3 shows the cell in place and a magne-

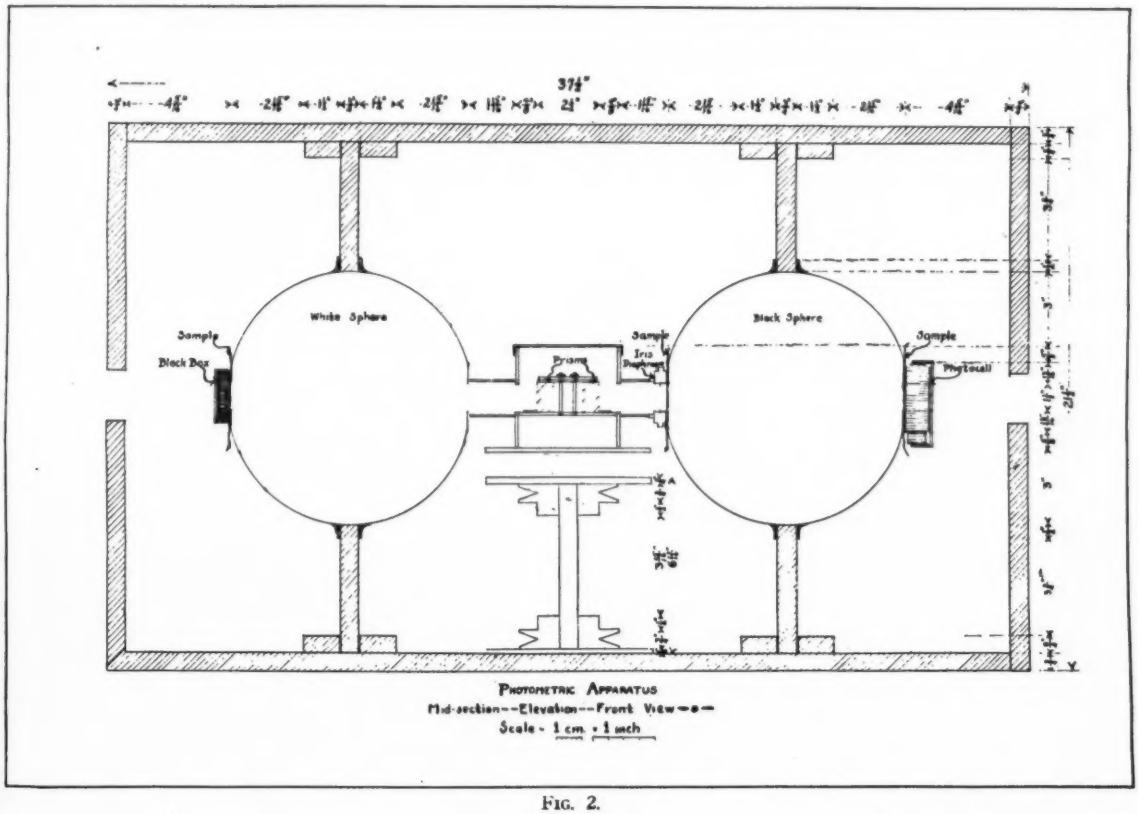

FIG. 2.

sium carbonate standard in the sample holder, where it will retain the energy of the incident beam within the integrating sphere.

The black sphere has a holder for mounting a photocell over the opening opposite the illuminator; thus, the beam impinges directly upon the cell surface. Samples may be inserted and maintained either between the illuminator and the sphere or between the photocell and the sphere. Figure 1 shows samples in both measuring positions, while Figure 3 illustrates the latter.

Westinghouse Photex cells were used in view of the fact that their spectral response very closely approximates the relative spectral sensitivity of the human eye. As the various measurements taken extended over a wide range of current values, the cells were calibrated for linearity and output readings were referred to the calibration curves in all cases. A Leeds and Northrup testing galvanometer (Serial No. 105170) was used for measuring current outputs; this instrument is peculiarly adaptable for the purpose, since it has a set of resistances which permit measurements from 0.075 to 750 microamperes.

With the exception of the interior of the white sphere, all surfaces of the apparatus were given a flat black finish.

Manipulation of the Photometric Device

After the optical system had been brought into proper focus and alignment, the various optical properties of the sample sheets were observed in the manner described below.

Reflectance values were measured by the use of the white sphere. A magnesium carbonate disc with a freshly prepared surface was placed over the sample opening and the cell output noted; when corrected by the calibration chart, this reading was proportional to 98 per cent of the energy of illumination. The sample was then placed over the opening and backed by a black box. Under ideal conditions the corresponding corrected cell reading would be proportional to the diffuse reflection of the sample. That is to say, the diffusely reflected light would be retained and integrated by the sphere, while the specular beam would pass back through the illumination opening. As a matter of technique it was found very difficult to insure that all of the specular beam was so returned, as the fragile sheets could not be rigidly placed in a plane and normal position. Therefore, a small wedge was used to place the sample at an angle of 4 deg. from normal incidence. The wedge is shown in the lower left section of the cabinet in Figs. 1 and 3. This insured that the specular beam was retained in the sphere and gave a cell reading proportional to the total reflection. Using matte surfaces, the photocell measurements as taken with the photometric device were carefully calibrated against those of a G. E. reflection meter (*3*). This gave a correction factor to compensate for the difference in the design of the two instruments and from this factor, measurements of total reflectance by the former, and of diffuse reflectance by the latter, an evaluation of specular reflectance was obtained.

Transmittance values were measured using the black sphere. A photocell reading was taken with no samples in the path of the beam and the corrected value taken as proportional to the energy of illumination. A sample was placed between the cell surface and the sphere, giving a cell reading which was proportional to the total transmission after correction for both linearity of the cell output and multiple reflections between the cell and sheet surfaces. This latter could be accomplished through a knowledge of the reflectance values of the two surfaces. The sample was then placed between the sphere and the illuminator. Non-scattered light proceeded directly to the cell surface, while all rays deviating by an angle more than 6.5 degrees were absorbed by the black interior surface. Thus, the cell output was proportional to the parallel transmission. The difference between the two transmittance values so obtained was taken as the diffuse transmittance.

Certain transmittance values could be taken with the white sphere. For instance, by placing the sample between the sphere and the illuminator, and allowing the parallel transmitted light to escape through the opposite opening, a direct measurement of diffuse transmittance values could be obtained. By placing the sample between the photocell and the sphere, and a magnesium carbonate standard in the path of the beam, a total transmittance value for diffuse illumination could be obtained.

Reproducibility and Accuracy of Results

The very nature of glassine paper renders accurate and reproducible measurements of optical properties difficult. Such properties are extremely non-uniform, in some cases varying as much as 30 to 40 per cent in a single sheet. Then, too, the fragility of the paper makes the properties sensitive to change upon the handling necessary for observation. To the greatest possible extent, identical samples were used throughout the entire course of this study, but since, in some cases, it was necessary to discard sheets upon which measurements had been taken and replace them with duplicate samples from the same lot of paper, undoubtedly there is a certain amount of unavoidable discrepancy from this source. In general, it is possible to obtain a very satisfactory check result with glassine paper by observing the same portion of the same sheet, and the only course for a representative value is a sufficiently large number of measurements. In some cases, the requisite number for a high degree of accuracy is prohibitively large; however, ten readings distributed across the machine direction of the sheet is considered as satisfactory for the more common conditions.

Non-uniformity between wire and felt sides of the samples was taken into account by alternating the direction from which they were observed. Non-uniformity with respect to grain in the sheets was taken into account by the use of circular areas for observation and the employment of parallel beams and an integrating sphere. Discrepancies resulting from sensitivity to the plane of focus were avoided by employing parallel beams and essentially normal illumination. The same type of illumination from a common source was used for all measurements and the slight variation due to spending of the battery was compensated for by rendering the results in terms of percentages of incident energy. Elimination of the effect of drift in the photocells was a matter of technique and care was taken to allow a sufficient time for adjustment to each energy level at which cell outputs were observed.

Two criteria of accuracy of the methods employed may be applied. The first of these is that the sums of transmittance and reflectance values for sheets of negligible absorptive properties should be essen-

tially 100 per cent. Colorless cellophanes very closely approximate these conditions and the results of two such sheets are given in Table I. Secondly, repeat measurements should give satisfactory checks. Such repeat measurements for sample W-E, the least transparent of the samples studied, are also presented in Table I. Based upon the application of these two criteria to the extremes of the range of properties observed, it is concluded that the overall accuracy of the results of the photometric device is within plus or minus 0.5 per cent of the energy of illumination.

Methods of Calculating Results

Original data for this study are on record in the thesis presented to The Institute of Paper Chemistry. As they are too voluminous for this paper, only calculated final results will be reported; the methods by which these were obtained are illustrated below:

Sample: W-E, calendered.

(*a*) Reflectance values

Data of the photometric device

Average galvanometer readings

Magnesium carbonate	18.11
Total reflection	8.45
Zero reading	0.24

Data of the G. E. reflection meter

Average reflection reading	45.0
Correction factor	0.936

Calculations

Total reflectance

Correction for zero reading

Magnesium carbonate..... 18.11 — 0.24 = 17.87

Total reflection ..... 8.45 — 0.24 = 8.21

Correction for cell characteristics

(At the energy levels involved the correction for cell characteristics is negligible)

Per cent total reflectance

$(8.21 \times 0.98 \times 100)/17.87 = 45.0\%$

Diffuse reflectance

$45.0 \times 0.936 = 42.1\%$

Specular reflectance

$45.0 - 42.1 = 2.9\%$

(*b*) Transmittance values

Data of the photometric device

Average galvanometer readings

Illumination	29.11
Parallel transmission	0.26
Total transmission	16.75

Reflectance data

Reflectance of cell	24.4%
Reflectance of sample	45.0%

Calculations

Correction for cell characteristics

(By reference to the photocell calibration chart the following values were obtained)

Illumination	32.00
Parallel transmission	0.29
Total transmission	18.10

Per cent parallel transmittance

$0.29/32.00 \times 100 = 0.9\%$

Per cent total transmittance

$[18.10 \times (1 - 0.244 \times 0.450)]/32.00 \times 100 = 50.4\%$

Per cent diffuse transmittance

$50.4 - 0.9 = 49.5\%$

(*c*) *Absorption value*

Calculated data

Total reflectance	45.0%
Total transmittance	50.4%

Per cent (Absorption)

$100 - (45.0 + 50.4) = 4.6\%$

(*d*) Per cent contrast visibility

Considering the sample as covering a black and white surface of which the white is an ideal diffuse reflector and the black has a reflectance of 1 per cent, equation 16 of Part I(*1*) takes the following form:

Per cent contrast visibility =

$100/(\log R_w/R_b) \times \log \{K T^2 R_w [1/(1 - R_w R_{is})] + R_{as}/R_{as}\}$

Sample W-E, calendered

K = Ratio of transmittance of parallel light to transmittance to diffuse light = 0.629

T = Total transmittance of sheet = 0.504

R_w = Diffuse reflectance of white surface = 1.00

R_{is} = Total reflectance of sheet = 0.450

R_{as} = Diffuse reflectance of sheet = 0.421

R_b = Diffuse reflectance of black surface = 0.01

Per cent contrast visibility =

$100/(\log 1.00/0.01) \times \log \{0.629 \times 0.504 \times 0.504 [1/(1 - 1.00 \times 0.45)] + 0.421\}/0.421 = 0.421$

(*e*) Contrast ratio

Considering the same conditions as those for which per cent contrast visibility was calculated, reflectance over black is identical with diffuse reflectance of the sample when the amount of light reflected from the black surface is considered as negligible. Reflectance over white for these conditions is

$100 \times \{KT^2 R_w [1/(1 - R_w R_{is})] + R_{as}\} = 100 \times \{0.629 \times 0.504 \times 0.504 \times [1/(1 - 1.00 \times 0.45)] + 0.42 = 71.1$

Contrast ratio = $42.1/71.1 = 0.591$

Interpretation and Discussion of Results

In addition to the data taken with the photometric device, reflectances over black and over white were taken by means of the Bausch and Lomb Opacimeter (*4*), (*5*), The General Electric reflection meter (*3*), and the General Electric recording color analyzer (*6*) and corresponding contrast ratio values were calculated. The latter instrument is equipped with a system of lenses such that a very rigid definition of parallel transmittance could be obtained. These measurements involved placing the sample in the path of a beam which was focused upon a very small reflecting area; another lens was focused to receive the reflection from this area and transmit it to the photocell. Light scattered by the sample was thus effectively eliminated from the system. All values appear in Tables II and III.

As discussed in Part I, the visual rankings of the samples by various observers gave rather erratic results, from which it was concluded that such ranking is dependable only where fairly large transparency increments are involved. Consistent with this conclusion the samples were divided into groups, each of which included sheets of approximately the same optical properties. The average measurements for each group are compared with the average net preference score as calculated from the visual ranking. This latter value is not, of course, strictly a measurement of transparency, but rather, represents an attempt to express the consensus of visual ranking in numerical terms suitable for plotting against instrumental values. In the case of the cellophanes, all observers agree that they were of practically identical transparency and very much better than the best glassine. Hence, these samples are not attributed a numerical net preference score but are left indefinite at some value considerably greater than the better paper samples. The use of group values, rather than individual datum points, tends to show the trends of the relationships which exist between various instrumental and visual observations rather than exact correlations. As there is a variance in the geometry of all of the instruments used and none, of course, duplicate that of the human eye, it is not surprising that somewhat discordant results seem invariably to result from different methods of measurement. Individual data are given in the tables

TABLE I.—DATA ILLUSTRATING DEPENDABILITY AND REPRODUCIBILITY OF THE RESULTS OF THE PHOTOMETRIC DEVICE

Sample	Total Reflection, Per cent	Total Transmission, Per cent	Sum	Absorption, Per cent
Cellophane, O-A.....	8.1	91.5	99.6	0.4
Cellophane, O-B.....	8.3	91.8	100.1	..

ORIGINAL DATA

Calendered Waxing Paper, W-E

	Average Galvanometer Readings Corresponding To: Transmission			Reflection		
Observation	Illumination	Parallel	Total	Illumination	Zero	Total
1st	30.29	0.32	17.17	16.45	0.25	7.68
2nd	29.03	0.32	16.55	15.53	0.26	7.23
3rd	29.11	0.26	16.75	18.11	0.24	8.45

CALCULATED DATA

REFLECTANCE VALUES

Observation	Illumin. cor. reading	Total Refln. cor. reading	Per cent of Reflectance of magnesium carbonate	Per cent Reflectance of incident on energy
1st	16.20	7.43	45.9	44.9
2nd	15.27	6.97	45.7	44.8
3rd	17.87	8.21	46.0	45.0

TRANSMITTANCE VALUES

Observation	Illumin. cor. reading	Parallel transm. cor. reading	Parallel transm. per cent	Total transm. cor. for cell	Total transm. cor. for reflection	Total transm. per cent
1st	33.40	0.35	1.05	18.55	16.43	49.2
2nd	31.90	0.35	1.10	17.90	15.85	49.7
3rd	32.00	0.29	0.91	18.10	16.10	50.4

and the extent of such discordances may be examined.

Transmittance Values and Transparency

Fig. 4 shows various transmittance values plotted against transparency as estimated by the net preference score. Total transmittance is obviously increasing very rapidly with transparency for the samples of poorer quality and asymptotically approaches a limiting value as transparency approaches perfection. Thus, measurements of total transmittance may be expected to have a high sensitivity to transparent qualities for translucent or opaque sheets but becomes decreasingly sensitive as the sheets become more transparent. In the range from the better glassines to cellophane, the sensitivity is very low. Diffuse transmittance is practically identical with total transmittance at the lower range of qualities observed, holds near a constant value for intermediate transparencies, and decreases very rapidly with increasing quality from the better glassines to cellophane. The nature of these relationships does not indicate that a measurement of diffuse transmittance, as such, is a suitable indication of transparent qualities. Parallel transmittance may be seen to deviate asymptotically from a value of zero for the poorer qualities observed and to increase as a nearly linear function with increasing transparency throughout the range under observation. It increases more strikingly in the increment between the better glassines and cellophane than in that between the former and the waxing papers. These relationships indicate that parallel transmittance will give a very satisfactory indication of quality, especially of higher quality, so long as the samples under observation have approximately the same absorption values. The scope of this study does not include colored papers. However, as pointed out in Part I, it is the capacity for scattering rays of light rather than the absolute

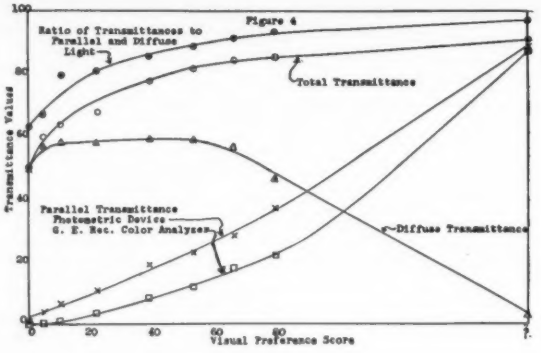

Fig. 4.

value of parallel transmittance which dominates other factors in determining transparency. Thus, the transparency ratio as an indication of scattering characteristics will be considered below.

Reflectance Values and Transparency

Values for reflectances over white and over black are plotted versus the visual estimation score in Fig. 5. As may be anticipated, these values vary according to the design of the different measuring instruments. Reflectances over white remain relatively constant throughout the range of qualities observed. The only consistent relationship appears in the values calculated for reflectance over an ideal white from the data of the photometric device. These increase as samples become increasingly transparent, thus continuing to approach the reflection of the ideal white surface. The shapes of the other curves are determined by the nature of the backing surface which in no case approached an ideal white.

Reflectances over black show a large percentage

TABLE II.—MEASUREMENTS OF THE PHOTOMETRIC DEVICE

Group	Sample	Net Preference Score	Total Transmittance	Parallel Transmittance	Diffuse Transmittance	Transparency Ratio	Diffuse Transmission Ratio	Specular Reflectance	Diffuse Reflectance	Per cent Absorption	Ratio of Transmissions to parallel and diffuse light
0	0-A	..*	91.5	89.3	2.2	97.6	2.4	8.0	0.1	0.4	0.969
	0-B	..*	91.8	89.0	2.8	97.0	3.0	7.7	0.6	0.0	0.975
	Avg.	..	*91.7*	*89.2*	*2.5*	*97.3*	*2.7*	*7.9*	*0.4*	*0.2*	*0.972*
1	3-O	88	86.9	37.5	49.4	43.1	56.9	6.3	4.5	2.2	0.930
	3-C	83	84.5	38.3	46.2	45.3	54.7	5.3	5.6	4.6	0.927
	3-B	80	85.0	38.0	47.0	44.7	55.3	5.9	5.2	3.9	0.931
	6-B	75	83.3	35.8	47.5	43.0	57.0	5.5	6.3	4.9	0.943
	4-B	72	85.7	35.1	40.6	41.0	59.0	5.9	5.6	2.8	0.922
	Avg.	*79.6*	*85.1*	*36.9*	*46.1*	*43.4*	*56.6*	*5.8*	*5.4*	*3.7*	*0.931*
2	1-S	71	83.5	30.4	53.1	36.4	63.6	5.3	6.8	4.4	0.908
	4-D	68	83.9	30.4	53.5	36.2	63.8	6.1	6.4	3.6	0.906
	1-W	67	84.4	26.7	57.7	31.6	68.4	5.7	7.4	2.5	0.906
	1-G	62	84.2	26.4	57.8	31.3	68.7	5.3	7.8	2.7	0.933
	6-D	61	83.8	26.0	57.8	31.0	69.0	5.2	8.0	3.0	0.925
	Avg.	*66.0*	*84.0*	*28.0*	*56.0*	*33.3*	*66.7*	*5.5*	*7.3*	*3.2*	*0.916*
3	4-A	56	80.5	23.6	56.9	29.3	70.7	4.7	11.2	3.6	0.896
	6-A	55	82.9	23.4	59.5	28.2	71.8	4.9	9.3	2.9	0.923
	4-E	50	79.8	21.1	58.7	26.5	73.5	4.9	11.0	4.3	0.883
	5-A	49	79.7	21.9	57.8	27.5	72.5	6.4	10.4	3.5	0.853
	Avg.	*53.0*	*80.7*	*22.5*	*58.2*	*27.9*	*72.1*	*5.2*	*10.5*	*3.6*	*0.889*
4	6-F	46	76.4	17.4	59.0	22.8	77.2	4.9	11.5	7.2	0.870
	1-B	43	78.5	19.3	59.2	24.6	75.4	4.7	12.0	4.8	0.846
	7-A	40	79.5	19.1	60.4	24.0	76.0	4.2	12.5	3.8	0.880
	2-A	37	76.6	17.6	59.0	23.0	77.0	3.2	14.7	5.5	0.843
	W-C	36	77.1	18.8	58.3	24.3	75.7	4.2	14.2	4.5	0.883
	W-6-C	31	74.9	18.7	56.2	24.9	75.1	4.5	16.6	4.0	0.832
	Avg.	*38.8*	*77.2*	*18.5*	*58.7*	*24.0*	*76.0*	*4.3*	*13.6*	*5.0*	*0.859*
5	W-G	26	69.6	12.1	57.5	17.6	82.4	3.8	21.9	4.7	0.857
	W-B	23	68.7	10.3	58.4	15.0	85.0	3.1	23.7	4.5	0.783
	W-H	20	66.3	9.0	57.3	13.6	86.4	3.7	23.8	6.2	0.775
	W-A	19	66.4	10.4	56.0	15.7	84.3	2.4	26.3	4.9	0.799
	Avg.	*22.0*	*67.7*	*10.4*	*57.3*	*15.5*	*84.5*	*3.3*	*23.9*	*5.1*	*0.803*
6	W-6-E	14	64.9	7.3	57.6	11.3	88.7	3.6	24.0	7.0	0.786
	W-M	11	63.4	6.5	56.9	10.2	89.8	3.3	29.1	4.2	0.809
	W-D	6	62.6	5.3	57.3	8.5	91.5	2.8	31.0	3.7	0.795
	Avg.	*10.3*	*63.6*	*6.4*	*57.3*	*10.0*	*90.0*	*3.2*	*28.0*	*5.0*	*0.797*
7	1-OP	5	59.3	3.3	56.0	5.5	94.5	1.8	32.2	6.7	0.670
8	W-E	0	50.4	0.8	49.6	1.6	98.4	2 3	42.1	5.2	0.629

* Cellophanes agreed by all observers to have practically identical transparencies which were very much superior to the best glassine.

change over the range of values observed. They decrease very rapidly with increasing transparency in the range of lower qualities and asymptotically approach a limiting value in the case of cellophanes. Thus, the sensitivity becomes low for the better types of sheets. Examination of the data will indicate that, of the various factors which determine the values of contrast ratio and per cent contrast visibility, it is reflectance over black which changes most and plays the major role.

Calculated Ratios and Transparency

Fig. 6 shows the visual estimation score plotted against the contrast ratio, the per cent contrast visibility, the transparency ratio, and the diffuse transmission ratio, all as calculated from the data of the photometric device. The contrast ratio bears essentially the same relationship to transparency as that of reflectance over black, that is, a decreasing sensitivity with increasing quality. The contrast visibility, which is a logarithmic rendition of the reciprocal of the contrast ratio, is, however, practically a straight line function of quality and the curve for transparency ratio is almost parallel to this line. When measured to the same degree of accuracy, neither of the values appear to have a decided superiority over the other as an indication of quality. However,

TABLE III.—MEASUREMENTS BY VARIOUS INSTRUMENTS

Photometric Device Calculated Values

Group	Samples	Reflectance Over White	Reflectance Over Black	100 × Contrast Ratio	Per cent Contrast Visibility
0	0-A	88.3	0.09	0.10	100
	0-B	90.2	0.60	0.67	100
	Avg.	*89.3*	*0.3*	*0.4*	*100*
1	3-O	83.3	4.5	5.4	63.4
	3-C	80.9	5.2	7.0	60.7
	3-B	79.8	5.6	6.4	59.6
	6-B	80.4	6.3	7.8	55.3
	4-B	81.9	5.6	6.8	58.2
	Avg.	*81.3*	*5.4*	*6.7*	*59.4*
2	1-S	78.8	6.8	8.6	53.2
	4-D	78.2	6.4	8.3	54.3
	1-W	81.6	7.4	9.1	52.1
	1-G	83.9	7.8	9.3	51.6
	6-D	83.0	8.0	9.6	50.8
	Avg.	*81.1*	*7.3*	*9.0*	*52.4*
3	4-A	80.2	11.2	13.9	42.7
	6-A	83.2	9.3	11.2	47.6
	4-E	77.9	11.0	14.1	42.5
	5-A	75.5	10.4	13.8	43.0
	Avg.	*79.2*	*10.5*	*13.2*	*44.0*
4	6-F	72.2	11.5	15.9	39.9
	1-B	74.6	12.0	16.1	39.7
	7-A	79.3	12.5	15.8	40.1
	2-A	74.8	14.7	19.6	35.3
	W-C	78.7	14.2	18.0	37.2
	W-6-C	77.7	16.6	21.5	33.5
	Avg.	*76.2*	*13.6*	*17.8*	*37.6*
5	W-G	77.9	21.9	28.1	27.6
	W-B	74.3	23.7	31.9	24.8
	W-H	70.8	23.8	33.6	23.7
	W-A	75.5	26.3	34.8	22.9
	Avg.	*74.6*	*23.9*	*32.1*	*24.7*
6	W-6-E	69.7	24.0	34.4	23.1
	W-M	77.2	29.1	38.0	21.2
	W-D	76.1	31.0	40.7	19.5
	Avg.	*74.3*	*28.0*	*37.7*	*21.3*
7	1-OP	67.9	32.2	47.4	16.2
8	W-E	71.3	42.1	59.1	11.4

Data of the General Electric Reflection Meter

Group	Samples	Reflectance Over White	Reflectance Over Black	100 × Contrast Ratio	Per cent Contrast Visibility*
0	0-A	66.0	1.0	1.5	97.7
	0-B	65.7	0.9	1.4	97.5
	Avg.	*65.9*	*0.95*	*1.45*	*97.6*
1	3-O	64.4	5.4	8.4	57.8
	3-C	61.4	6.1	9.9	53.9
	3-B	62.6	5.1	8.1	58.4
	6-B	60.5	7.2	11.9	49.5
	4-B	65.2	6.3	9.7	54.5
	Avg.	*62.8*	*6.0*	*9.6*	*54.8*
2	1-S	62.2	7.6	12.2	49.0
	4-D	62.8	8.5	13.6	46.5
	1-W	64.8	7.8	12.0	49.3
	1-G	65.6	9.1	13.9	46.0
	6-D	65.4	8.3	12.7	48.1
	Avg.	*64.2*	*8.3*	*12.9*	*48.0*
3	4-A	65.9	10.7	16.2	42.3
	6-A	65.8	9.0	13.7	46.3
	4-E	64.6	11.4	17.6	40.4
	5-A	63.2	13.2	20.9	36.5
	Avg.	*64.9*	*11.1*	*17.1*	*41.4*
4	6-F	60.7	12.6	20.8	36.6
	1-B	64.2	13.5	21.0	36.3
	7-A	66.7	13.3	20.0	37.1
	2-A	64.9	14.3	22.1	35.2
	W-C	66.7	15.8	23.7	33.5
	W-6-C	67.1	20.8	31.0	27.3
	Avg.	*65.0*	*15.1*	*23.1*	*34.3*
5	W-G	67.7	21.3	31.4	26.9
	W-B	67.6	24.6	36.4	23.5
	W-H	66.7	26.7	39.4	21.6
	W-A	70.0	26.3	37.6	22.8
	Avg.	*68.3*	*24.7*	*36.2*	*23.7*
6	W-6-E	63.9	26.4	41.3	20.6
	W-M	69.3	31.8	45.9	18.1
	W-D	71.2	32.0	45.0	18.6
	Avg.	*68.1*	*30.1*	*44.1*	*19.1*
7	1-OP	69.7	33.2	47.7	17.3
8	W-E	72.5	45.9	63.3	10.6

Filter No. 5 used.
White Standard Reading 73.2
Black Standard Reading 00.0
* Calculated assuming log (Reflectance of Black Standard) = 0.0.

Data of the Bausch and Lomb Opacimeter

Group	Samples	Reflectance Over White	Reflectance Over Black	100 × Contrast Ratio	Per cent Contrast Visibility*
0	0-A	95.6	7.6	8.0	97.8
	0-B	97.2	8.0	8.2	96.8
	Avg.	*96.4*	*7.8*	*8.1*	*97.3*
1	3-O	89.8	10.5	11.7	83.1
	3-C	87.3	11.2	12.8	79.6
	3-B	88.3	11.4	12.9	79.3
	6-B	84.2	11.2	13.3	78.1
	4-B	90.4	11.5	12.7	79.9
	Avg.	*88.0*	*11.2*	*12.7*	*80.0*
2	1-S	85.5	12.5	14.6	74.5
	4-D	88.1	14.4	16.4	70.1
	1-W	90.7	13.8	15.2	72.9
	1-G	90.7	13.9	15.3	72.6
	6-D	90.3	13.2	14.6	74.5
	Avg.	*89.3*	*13.6*	*15.2*	*72.9*
3	4-A	89.5	16.4	18.3	65.7
	6-A	90.0	15.0	16.7	69.4
	4-E	88.7	17.4	19.6	63.1
	5-A	86.3	17.1	19.8	62.7
	Avg.	*88.6*	*16.5*	*18.6*	*65.2*
4	6-F	80.8	17.4	21.5	59.5
	1-B	87.4	19.2	22.0	58.7
	7-A	90.0	18.0	20.0	62.3
	2-A	85.1	19.6	23.0	56.9
	W-C	88.8	20.0	22.5	57.8
	W-6-C	89.3	26.6	29.8	47.0
	Avg.	*86.9*	*20.1*	*23.1*	*57.0*
5	W-G	89.5	28.1	31.4	44.9
	W-B	89.8	29.9	33.3	42.6
	W-H	84.9	31.6	37.2	38.2
	W-A	88.7	32.8	37.0	38.5
	Avg.	*88.2*	*30.6*	*34.7*	*41.1*
6	W-6-E	83.7	30.7	36.7	38.9
	W-M	89.3	37.9	42.4	33.2
	W-D	91.3	38.5	42.1	33.5
	Avg.	*88.1*	*35.7*	*40.4*	*35.2*
7	1-OP	88.5	38.2	43.2	32.5
8	W-E	90.3	52.3	57.9	21.2

* Calculating assuming:

$$\log \frac{\text{(Reflectance Over White)}}{\text{(Reflectance Over Black)}} = 1.1220$$

Data of the General Electric Recording Color Analyzer*

Group	Samples	Reflectance Over White	Reflectance Over Black	100 × Contrast Ratio	Per cent Contrast Visibility	Parallel Transmittance
0	0-A	73.4	3.7	5.0	98.3	88.5
	0-B	72.8	4.0	5.5	95.5	87.5
	Avg.	*73.1*	*3.8*	*5.2*	*96.9*	*87.0*
1	3-O	68.6	6.3	9.2	78.5	22.1
	3-C	64.8	6.5	10.0	75.5	24.8
	3-B	66.1	6.6	10.0	75.0	23.8
	6-B	64.4	8.1	12.6	68.1	15.8
	4-B	69.0	8.0	11.6	70.8	22.7
	Avg.	*66.6*	*7.1*	*10.7*	*73.6*	*21.8*
2	1-S	65.0	8.9	13.7	65.2	18.1
	4-D	66.3	8.2	12.4	68.6	20.2
	1-W	68.4	8.9	13.0	67.0	15.3
	1-G	68.4	10.0	14.6	63.1	15.5
	6-D	70.6	9.9	14.0	64.4	16.7
	Avg.	*67.7*	*9.2*	*13.5*	*65.7*	*17.2*
3	4-A	67.6	11.8	17.5	57.4	11.4
	6-A	69.9	11.0	15.8	60.7	12.5
	4-E	66.4	13.4	20.2	52.6	11.6
	5-A	67.6	12.4	18.3	55.7	10.6
	Avg.	*67.9*	*12.2*	*17.9*	*56.6*	*11.5*
4	6-F	63.8	14.0	21.9	49.8	8.5
	1-B	65.9	13.8	21.0	51.3	7.4
	7-A	68.5	13.9	20.3	52.3	..
	2-A	65.5	14.0	21.4	50.7	7.6
	W-C	70.1	18.0	25.7	44.7	8.7
	W-6-C	70.3	21.7	30.9	38.7	7.6
	Avg.	*67.4*	*15.9*	*23.5*	*47.9*	*8.0*
5	W-G	67.8	18.9	27.9	41.9	6.2
	W-B	67.7	22.3	33.0	36.5	1.1
	W-H	67.6	25.3	37.5	32.3	1.3
	W-A	65.4	23.8	36.4	33.2	3.3
	Avg.	*67.1*	*22.6*	*33.7*	*36.0*	*3.0*
6	W-6-E	67.0	27.3	40.7	29.5	1.8
	W-M	68.7	30.1	44.0	27.1	0.34
	W-D	72.3	30.8	42.6	28.0	0.13
	Avg.	*69.3*	*29.4*	*42.4*	*28.2*	*0.76*
7	1-OP	71.3	32.3	45.3	26.0	0.00
8	W-E	71.4	39.9	56.0	19.1	0.00

* Average readings between 460 and 640 millimicrons.
Standard White Reading = 79.2
Standard Black Reading = 3.7

it must be remembered that the transparency ratio is governed largely by the parallel transmittance, which becomes progressively more sensitive with increased quality, while per cent contrast visibility is most affected by reflectance over black, which becomes progressively less sensitive with increased quality. Thus, as a matter of design and technique, it is more feasible to obtain accurate measurements of quality of highly transparent samples by the employment of the transparency ratio, while translucent or opaque papers are more conveniently evaluated by means of the contrast ratio or per cent contrast visibility.

When considered in the light of visual response, it is to be remembered that transparency ratio, in indicating the degree of scattering, is a true indication of the clarity with which an image may be resolved when looking through a sheet. The data presented herein show an approximately parallel relationship between transparency ratio and per cent contrast visibility, the latter of which has been dis-

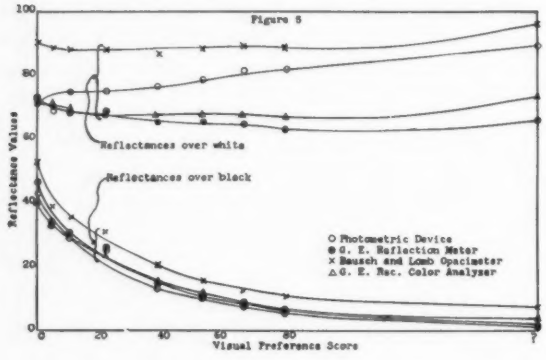

FIG. 5.

cussed in Part I as a true indication of the reduction in contrast effected by a covering sheet. Thus, it is concluded that the transparency ratio is fundamentally dependable as an indication of clear resolution of an image and, at least in an empirical manner, is governed by the same factors which determine reduction in contrast. For these reasons the measurement is considered as a dependable criterion of transparency as observed visually and no complicated mathematical expression for interpreting it in terms of visual response is deemed necessary.

When expressed on a percentage basis, diffuse transmission ratio is the difference between 100 and

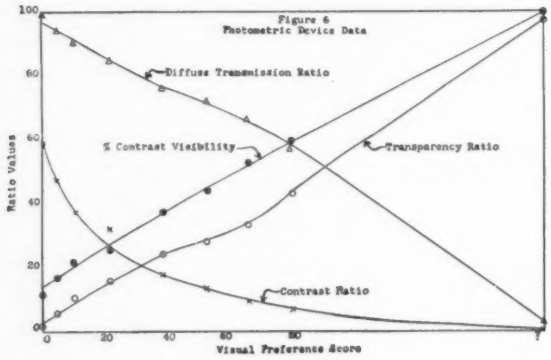

FIG. 6.

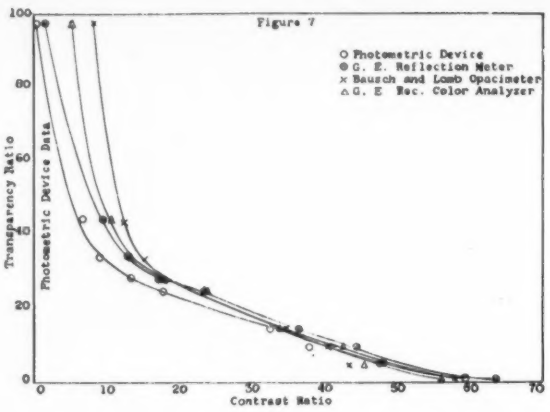

FIG. 7.

the transparency ratio. Thus, the conclusions for the one will apply to the other.

CONTRAST RATIO AND TRANSPARENCY RATIO

In support of the conclusion that transparency ratio is more applicable for evaluating highly transparent sheets and contrast ratio more suitable for translucent and opaque papers, Fig. 7 shows these values plotted against each other. The shapes of the curves are suggestive of the hyperbola. Obviously, transparency ratio is more sensitive to quality in the range where contrast ratio is low and transparency is high, while contrast ratio is more sensitive for the converse conditions.

PER CENT CONTRAST VISIBILITY AND TRANSPARENCY RATIO

In Fig. 8 transparency ratio as obtained by the photometric device is plotted against contrast visibility as calculated from the data of various instruments. The relationship is seen to vary from an approximate straight line to a decided curve depending upon the design of the measuring instrument. In general, there is a tendency toward a more marked increased in transparency ratio as the quality increases, with the converse condition for contrast visibility. The shapes of the curves suggest that the

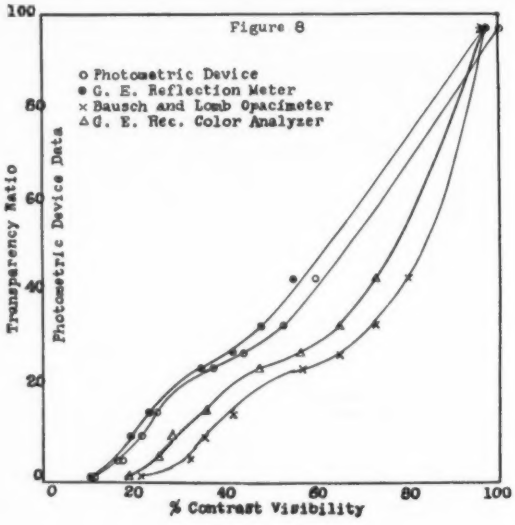

FIG. 8.

TABLE IV.—MEASUREMENTS OF CONTRAST RATIO AND TOTAL TRANSMITTANCE

Sample No.	Contrast Ratio: Bausch and Lomb Opacimeter	Contrast Ratio: Special Opacimeter	Per cent Total Transmittance I. P. C. Transparency Meter
1	0.105	0.100	85.0
2	0.118	0.106	83.4
3	0.196	0.187	77.6
4	0.348	0.319	63.7
5	0.354	0.317	61.5
6	0.451	0.386	53.0
7	0.530	0.460	46.0
8	0.630	0.540	38.4
9	0.697	0.687	30.5
10	0.750	0.655	28.8
11	0.746	0.653	28.8
12	0.768	0.684	27.9
13	0.837	0.769	21.7
14	0.826	0.767	21.5
15	0.965	0.933	8.9

design of the photometric device does not give a strict differentiation between parallel and diffuse transmittances for the less transparent samples. The upper parts of the curves appear to converge toward a limiting value of transparency ratio of about 15 and then break in a more or less erratic manner. It was not feasible to take complete data by means of the General Electric color analyzer for determining transparency ratio. However, in Fig. 9 are shown parallel transmittance values, as determined by this instrument, plotted against contrast visibilities. With the more rigorous definition of parallel transmittance, the curves do indeed approach a limiting lower value in asymptotic manner. Again, the shapes are suggestive of hyperbolas. From a practical point of view it is not necessarily to be implied that the more rigorous definition of parallel transmittance necessarily gives more valuable results. One effect of selecting the more narrow limits, which may be observed from the parallel transmittance curves in Fig. 4, is the decrease in both numerical values and sensitivity to quality in the lower range. In designing a measuring instrument, that definition is to be selected which gives the best compromise between convenience of measurement and ultimate significance of the results.

Contrast Ratio and Total Transmittance

There has been much discussion over the relative virtues of the contrast ratio method and the total transmittance method of measuring opacities. In the course of this study it has come about that samples of the same paper have been measured by

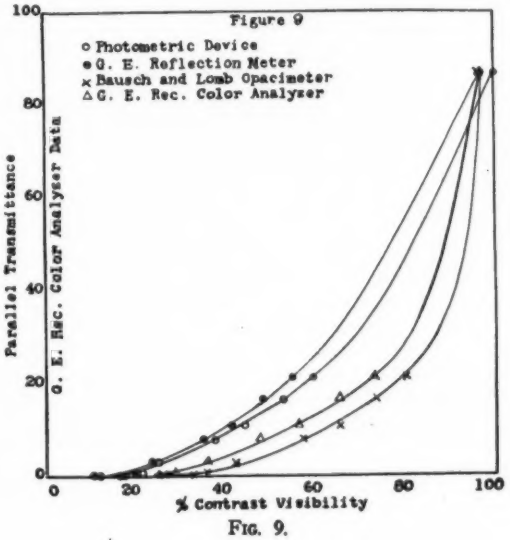

Fig. 9.

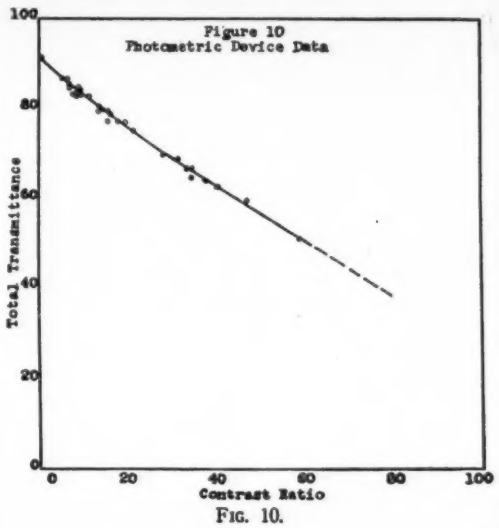

Fig. 10.

the two methods. In Fig. 10, contrast ratio values are plotted against total transmittance values, both as determined by the photometric device. Comparison of the data in Table III will show that the correlation between contrast ratio values as observed by various instruments is about on a par with the correlation between the two methods.

In Table IV is presented a group of data giving total transmittance measurements as observed with The Institute of Paper Chemistry transparency meter (*2*), contrast ratios as observed with the Bausch and Lomb Opacimeter, and contrast ratios as observed with another design of opacimeter which involves the use of an integrating sphere. In taking these data, care was observed to test identical portions of the same sheets. The data are presented graphically in Figure 11. While no theoretical basis may be advanced for its explanation, there undoubtedly exists an empirical relationship between total transmittance and contrast ratio measurements. None of the sheets involved were very deeply colored and it is anticipated that the relationship will not hold for papers of widely varying absorptive properties.

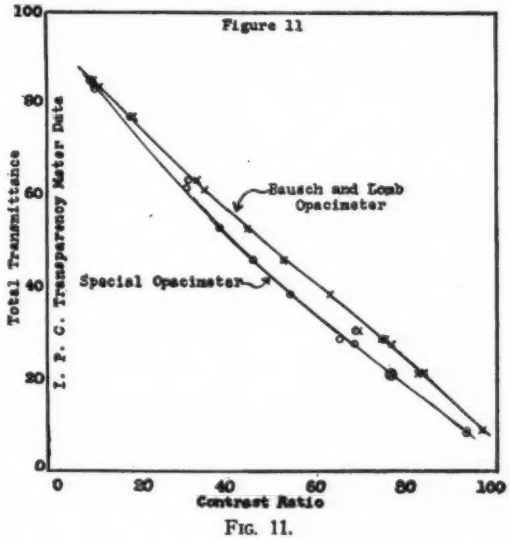

Fig. 11.

THE INSTITUTE OF PAPER CHEMISTRY TRANSPARENCY METER

The Staff of The Institute of Paper Chemistry has designed a transparency meter (*2*) for measuring total and parallel transmittance values from which transparency ratio may be calculated. Based upon both a theoretical consideration and an independent study of correlation of visual ranking with instrumental values, it is concluded by the Institute Staff that parallel transmittance gives a good single measurement of transparency of tinted white glassine sheets and can be used for mill control; it is felt, however, that transparency ratio is a more dependable general measurement as it may be extended to include colored sheets.

Summary

The objective optical properties which are pertinent to transparency have been defined. An experimental photometric device for measuring these properties in a group of transparent sheets has been described and the methods of calculating and interpreting the results have been discussed.

The results of an instrumental study including measurements with this photometric device, a General Electric Reflection Meter, a Bausch and Lomb Opacimeter and a General Electric Recording Color Analyzer have been presented. It is shown that transparency ratio and diffuse transmission ratio are measurements which indicate both clarity of resolution of an image and also the reduction in contrast when a transparent sheet is being seen through. From correlation with visual rankings, it is concluded that these two ratios become more sensitive to changes in quality as sheets become more transparent. Contrast ratio and per cent contrast visibility indicate the reduction in contrast effected by a covering sheet and become more sensitive to changes in quality as sheets become less transparent. It is concluded that for sheets of approximately the same absorptive properties there exists an empirical linear relationship between total transmittance and contrast ratio values. Reference is made to a transparency meter which has been designed to employ the principles developed in the course of this study.

Literature Cited

(1) *Paper Trade J.* 105 no. 17: 31-40 (Oct. 21, 1937).
(2) Institute of Paper Chemistry. Instrumentation Studies XVII. *Paper Trade J.* 105, no. 2: 41-8; No. 3: 35-44 (July 8, 15, 1937).
(3) Lewis, L. C. *Paper Trade J.* 98, no. 26: 71-73 (June 28, 1934).
(4) Forrest, J. W. *Instruments* 6: 200 (1933).
(5) Davis, M. N. *Paper Trade J.* 96, no. 19: 38-40 (May 11, 1933).
(6) Hardy, A. C. *J. Optical Soc. Am.* 18: 96-117 (1929).

Welded Fittings

A booklet on "Welded Fittings for Industrial Piping" prepared for the paper industry, has just been issued by the Chase Brass & Copper Co., Waterbury, Conn. The company was one of the early pioneers in the development of copper tube and tube fittings. The publication describes a new line of copper and bronze welded fittings, which the company states is of lighter weight than the conventional cast flanged fittings, gives longer service and reduces corrosion. Complete roughing in dimensions are given, with full information on copper tubing, which is stated to be growing in favor for pulp, white water, and stock lines. Other products for the industry are also included.

TAPPI Notes

The Empire State Section of the Technical Association of the Pulp and Paper Industry will meet at the Onandaga Hotel, Syracuse, N. Y., Saturday, November 19, 1938. There will be a discussion of paper machine drives.

The Kalamazoo Valley Section of TAPPI will meet at the Park-American Hotel, Kalamazoo, Mich., Thursday, November 3, 1938. John Traquair, of the Mead Corporation, Chillicothe, Ohio, will talk on "Reclamation of Old Papers, Carbonate Filled" and M. W. Phelps, of the Solvay Process Company will discuss "The Bleaching of Pulp."

H. T. Baker, formerly with Bagley and Sewall, Watertown, N. Y., is now with H. K. Ferguson Company, Cleveland, Ohio, Construction Engineers.

W. A. Chapman, formerly with Skinner & Sherman, Inc., Boston, Mass., is now with Robert W. Hunt Company, Chicago, Ill.

H. H. Lagerpusch, formerly of the American Coating Mills, Elkhart, Ind., is now with the Stecher-Traung Company, Rochester, N. Y.

Vincent F. Waters, formerly plant engineer of the Wrenn Paper Company, Middletown, Ohio, and research engineer of the Champion Paper and Fibre Company, Hamilton, Ohio, has joined the staff of the Technical Association as Technical Assistant to the Secretary.

Vibrating Screen by Allis-Chalmers

A new bulletin on vibrating screens that will undoubtedly be of great interest to many industries has just been released by the Crushing Division of the Allis-Chalmers Manufacturing Company, Milwaukee, Wisconsin.

This bulletin (Number 1474-B) covers Allis-Chalmers new "Aero-Vibe" inclined type of screens that float in the air suspended by cables and springs. These ingenious screens utilize a mechanical mechanism of the offcenter weight type to produce their vibrating motions. Illustrations include both single and double deck types.

Allis-Chalmers "Aero-Vibe" screens are said to be applicable to most any materials sized for commercial purposes, including gravel, sand, limestone, trap rock, various ores, crushed stone and slag, phosphate oyster shells, cement, coal, coke, anhydrous caustic, salt, metallic scrap, commercial fertilizers, roofing granules, wood chips, etc.

Roller Chains and Sprockets

Rex roller chains and sprockets are described in Catalogue No. 333 issued by the Chain Belt Company, 1600 West Bruce street, Milwaukee, Wis. Rex chains and sprockets are made for chain application requiring high speed, compactness, quiet operation and high efficiency. The company states they are constructed of specially selected steels and represent a highly successful development in high speed power transmission chains. They are available in standard and non-standard series, with a variety of attachments and are obtainable through numerous distributors and branch offices in major cities. The publication also gives list prices, dimensions and engineering information on the selection and application of roller chain drives.

Imports of Paper and Paper Stock

Giving Manifests of New York, Boston, Philadelphia and Other Ports of Newsprint, Wrapping, Writing, Coated, Blotting, Tissue, Strawboard, Wallboard, Cigarette Papers, Sulphite, Kraft and Ground Wood Pulp.

NEW YORK IMPORTS

WEEK ENDING OCTOBER 22, 1938

SUMMARY

Cigarette paper .....1,430 cs.
Wall paper .....3 cs.
Paper handings .....8 bls., 1 cs.
Painted paper .....1 cs.
Newsprint .....345 bls., 14,158 rolls
Printing paper .....1 cs.
Packing paper .....41 cs.
Filter paper .....24 cs.
Filter compound .....100 bls., 50 cs.
Filter pulp .....6 bls.
Drawing paper .....33 cs.
Surface baryta coated paper .....3 cs.
Surface coated paper .....1 cs.
Basic paper .....54 crates, 77 cs.
Decalcomanias .....28 cs.
Writing paper .....14 cs.
Tissue paper .....7 cs.
Fancy paper .....3 pkgs.
Grease proof paper .....24 cs.
Miscellaneous paper .....27 cs.

CIGARETTE PAPER

H. H. Strauss, *Pipestone County,* Bordeaux, 347 cs.
American Tobacco Co., *Pipestone County,* Bordeaux, 630 cs.
Suarez & Crespo, *Pipestone County,* St. Nazaire, 2 cs.
Globe Shipping Co., *Excambion,* Marseilles, 2 cs.
De Mauduit Paper Corp., *Fort Richepanse,* Havre, 1 cs.
De Mauduit Paper Corp., *Champlain,* Havre, 2 cs.
Chamoagne Paper Corp., *Champlain,* Havre, 446 cs.

WALL PAPER

A. L. Diament & Co., *Champlain,* Havre, 2 cs.
Rohner Gehrig & Co., *Champlain,* Havre, 1 cs.

PAPER HANGINGS

W. H. S. Lloyd & Co., *American Farmer,* London, 8 bls, 1 cs.

PAINTED PAPER

W. H. S. Lloyd & Co., *Fort Richepanse,* Havre, 1 cs.

NEWSPRINT

News Syndicate Co., Inc., *Louisianan,* Comeau Bay, 6216 rolls.
Perkins Goodwin & Co., *New York,* Hamburg, 150 rolls.
Jay Madden Corp., *New York,* Finland, 664 rolls, 345 bls.
Trust Co., of North America, *New York,* Finland 1421 rolls.
N. Y. Evening Journal, *New York,* Finland, 256 rolls.
N. Y. Evening Journal, *Markland,* Liverpool, N. S., 669 rolls.
N. Y. Tribune, Inc., *Markland,* Liverpool, N. S., 1841 rolls.
World Telegram, *Markland,* Liverpool, N. S., 599 rolls.
Brooklyn Daily Eagle, *Markland,* Liverpool, N. S., 303 rolls.
Herald Statesman, Inc., *Markland,* Liverpool, N. S., 42 rolls.
Gilman Paper Co., *Hallaren,* Norrkoping, 377 rolls.
———, *Hallaren,* Norrkoping, 159 rolls.
Boston Paper Board Co., *Hallaren,* Norrkoping, 97 rolls.
Brooklyn Daily Eagle, *Hallaren,* Norrkoping, 70 rolls.
N. Y. Post, *Ravnaas,* Port Alfred, Quebec, 956 rolls.
———, *Bergensfjord,* Oslo, 31 rolls.
———, *Hansa,* Finland, 139 rolls.
Jay Madden Corp., *Hansa,* Finland, 168 rolls.

PRINTING PAPER

Japan Paper Co., *American Farmer,* London, 1 cs.

PACKING PAPER

Steiner Paper Corp., *New York,* Hamburg, 41 cs.

FILTER PAPER

C. Schleicher & Schull Co., *N. Amsterdam,* Rotterdam, 10 cs.
Phoenix Shipping Co., *New York,* Hamburg, 1 cs.
H. Reeve Angel & Co., Inc., *American Farmer,* London, 13 cs.

FILTER COMPOUND

H. Reifenberg, *New York,* Hamburg, 100 bls., 50 cs.

FILTER PULP

C. Schleicher & Schull Co., *N. Amsterdam,* Rotterdam, 6 bls.

DRAWING PAPER

H. Reeve Angel & Co., Inc., *American Farmer,* London, 3 cs.
Keuffel & Esser Co., *Hansa,* Hamburg, 30 cs.

SURFACE BARYTA COATED PAPER

Globe Shipping Co., *New York,* Hamburg, 3 cs.

SURFACE COATED PAPER

Gevaert Co., of America, *Alex van Opstal,* Antwerp, 1 cs.

BASIC PAPER

Globe Shipping Co., *New York,* Hamburg, 54 crates, 26 cs.
Globe Shipping Co., *Hansa,* Bremen, 51 cs.

DECALCOMANIAS

Sellers Transportation Co., *New York,* Hamburg, 9 cs.
Sellers Transportation Co., *Europa,* Bremen, 17 cs.
———, *Europa,* Bremen, 2 cs.

WRITING PAPER

H. W. Robinson Co., *New York,* Hamburg, 14 cs.

TISSUE PAPER

Lansen Naeve Co., *New York,* Hamburg, 2 cs. (coated)
W. J. Byrnes Co., *Queen Mary,* Southampton, 1 cs.
Dingelstedt & Co., *Laconia,* Liverpool, 4 cs.

FANCY PAPER

C. A. Haynes Co., *Queen Mary,* Southampton, 3 pkgs.

GREASE PROOF PAPER

———, *Bergensfjord,* Drammen, 24 cs.

MISCELLANEOUS PAPER

Ensign Manfg. Co., *Asosan Maru,* Yokohama, 10 cs.
Remington Rand, Inc., *Asosan Maru,* Yokohama, 10 cs.
Bloomingdale Bros., *Fort Richepanse,* Havre, 1 cs.
The Morilla Co., *Champlain,* Havre, 6 cs.

RAGS, BAGGINGS, ETC.

———, *Baalbek,* Lisbon, 80 bls. bagging.
Irving Trust Co., *Baalbek,* Alexandria, 102 bls. bagging.
Darmstadt Scott & Courtney, *Black Falcon,* Rotterdam, 58 bls. bagging.
Banco Coml. Italiane Trust Co., *J. Jadot,* Antwerp, 86 bls. jute waste.
Royal Manfg. Co., *J. Jadot,* Antwerp, 95 bls. cotton waste.
Chase National Bank, *Pipestone County,* Bordeaux, 225 bls. rags.
E. J. Keller Co., Inc., *Pipestone County,* ———, 230 bls. rags.
Loumar Textile By Products, *Pipestone County,* Havre, 112 bls. bagging.
Darmstadt Scott & Courtney, *Pipestone County,* Havre, 120 bls. bagging.
Keene, Inc., *Pipestone County,* Havre, 47 bls. rags, 473 bls. dark cottons.
E. J. Keller Co., Inc., *Excambion,* ———, 208 bls. rags.
W. Steck & Co., *Excambion,* Alexandria, 514 bls. bagging.
W. J. Green Co., *Excambion,* Alexandria, 124 bls. rags.
Irving Trust Co., *Excambion,* Alexandria, 66 bls. bagging.
Chase National Bank, *Excambion,* Alexandria, 92 bls. bagging.

R. Blank, *Excambion,* Alexandria, 283 bls. bagging, 146 bls. rags.
Castle & Overton, Inc., *Excambion,* Alexandria, 85 bls. rags, 111 bls. bagging.
E. J. Keller Co., Inc., *Alberta,* ———, 85 bls. rags, 57 bls. bagging.
———, *Laconia,* Liverpool, 46 bls. bagging.
———, *Exchange,* Alexandria, 146 bls. rags, 163 bls, bagging.
R. Blank, *Exchange,* Alexandria, 154 bls. rags.
W. Steck & Co., *Exchange,* Alexandria, 254 bls. bagging.
Castle & Overton, Inc., *Exchange,* Alexandria, 111 bls. bagging, 85 bls. rags.
E. J. Keller Co., Inc., *Exchange,* ———, 145 bls, rags.
———, *Exchange,* Genoa, 664 bls. rags.

OLD ROPE

Chase National Bank, *Gloucester City,* Bristol, 180 coils.
———, *Gloucester City,* Bristol, 50 coils.
F. Stern, *Black Falcon,* Rotterdam, 66 coils.
W. Steck & Co., *Black Falcon,* Rotterdam, 43 coils.
Chase National Bank, *J. Jadot,* Antwerp, 82 coils.
E. J. Keller Co., Inc., *Alberta,* ———, 51 pkgs.
E. J. Keller Co., Inc., *Binnendyk,* ———, 64 bls.
W. Steck & Co., *Artigas,* Glasgow, 105 coils.
Banco Coml. Italiane Trust Co., *Artigas,* Glasgow, 75 coils.

WOOD PULP

Price & Pierce, Ltd., *Hallaren,* Wallvik, 1500 bls. unbleached sulphite.
———, *Hallaren,* Riga, 1016 bls. sulphite.
———, *New York,* Hamburg, 2800 bls. wood pulp, 560 tons.
———, *Hansa,* Bremen, 250 bls. wood pulp, 51 tons.

WOOD PULP BOARDS

W. Bersch, *Hansa,* Hamburg, 250 bls.
W. Bersch, *New York,* Hamburg, 299 bls.
———, *New York,* Hamburg, 35 bls. (sheets).

NEWARK IMPORTS

WEEK ENDING OCTOBER 22, 1938

H. G. Craig Co., *Donpaco,* Donnacona, 328 rolls newsprint.
H. G. Craig Co., *A. C. D.,* Donnacona, 339 rolls newsprint.
———, *C. J. Kampmann,* Sheet Harbor, N. S., 1738 bls. wood pulp.

ALBANY IMPORTS

WEEK ENDING OCTOBER 22, 1938

———, *C. J Kampmann,* Sheet Harbor, N. S., 10324 bls. wood pulp.

BOSTON IMPORTS

WEEK ENDING OCTOBER 22, 1938

Tradesmans Natl. Bank Trust Co., *Hallaren,* Norrsundet, 1625 bls. sulphate.
Pagel Horton & Co., Inc., *Hallaren,* Gefle, 1075 bls. sulphite, 500 bls. sulphate.
Edgren Trading Co., *Black Heron,* Antwerp, 1 bls. wrapping paper.
Royal Manfg. Co., *Black Heron,* Antwerp, 48 bls. cotton waste.
R. D. Barry Co., *Black Heron,* Rotterdam, 11 bls. bagging.

PHILADELPHIA IMPORTS

WEEK ENDING OCTOBER 22, 1938

E. J. Keller Co., Inc., *Black Falcon,* ———, 44 coils old rope, 194 bls. bagging.
E. J. Keller Co., Inc., *Pipestone County,* ———, 655 bls. rags.
R. Wilson Paper Corp., *Artigas,* Glasgow, 14 rolls printing paper.
Philadelphia Natl. Bank, *Artigas,* Liverpool, 218 bls. bagging.
Price & Pierce, Ltd., *Schwanheim,* ———, 900 bls, unbleached sulphite, 390 bls. unbleached sulphate.

WILMINGTON IMPORTS

WEEK ENDING OCTOBER 22, 1938

———, *C. J. Kampmann,* Sheet Harbor, N. S., 3475 bls. wood pulp.
Price & Pierce, Ltd., *Schwanheim,* ———, 8400 bls. unbleached sulphite, 600 bls. unbleached mechanical pulp.

BALTIMORE IMPORTS

WEEK ENDING OCTOBER 22, 1938

Washington Post, *Markland,* Liverpool, N. S., 2597 rolls newsprint.
———, *Hallaren,* Norrkoping, 1438 rolls newsprint.
Price & Pierce, Ltd., *Hallaren,* Wallvik, 1740 bls. unbleached sulphite.
Tradesmans Natl. Bank Trust Co., *Hallaren,* Norrsundet, 1425 bls. sulphate.
Pagel Horton & Co., Inc., *Hallaren,* Gefle, 1250 bls, sulphite.
———, *Hallaren,* Gefle, 671 bls. sulphite.
Price & Pierce, Ltd., *Schwanheim,* ———, 900 bls, unbleached sulphite, 840 bls. unbleached mechanical pulp.

NEWPORT NEWS IMPORTS

WEEK ENDING OCTOBER 22, 1938

Price & Pierce, Ltd., *Schwanheim,* ———, 5400 bls. unbleached sulphite.

NORFOLK IMPORTS

WEEK ENDING OCTOBER 22, 1938

National City Bank, *Artigas,* Liverpool, 1800 bls. waste sacking.
National City Bank, *Artigas,* Manchester, 103 bls. bagging.

NEW ORLEANS IMPORTS

WEEK ENDING OCTOBER 22, 1938

E. J. Keller Co., Inc., *Louisiane,* ———, 185 bls. paperstock.

MONTREAL IMPORTS

WEEK ENDING OCTOBER 22, 1938

Pagel Horton & Co., Inc., *Delhi,* Sweden, 16500 bls. wood pulp.
Gottesman & Co., Inc., *Delhi,* Sweden, 5100 bls. wood pulp.
Gottesman & Co., Inc., *Lagaholm,* Sweden, 4500 bls. wood pulp.

G. A. Breschel Opens Agency

Gustav A. Breschel, who has been engaged in the paper business for the last twenty years as general sales manager of the Herz Manufacturing Company, has severed his connection with that organization to open a sales agency for paper products in the New York Metropolitan district.

"When I first went with the Herz organization on July 1, 1918," said Mr. Breschel in outlining his plans, "the only paper product that they manufactured was Hygeia sippers (sanitary soda straws). About five years later Sunshine straws were launched and soon achieved not only a national but a world wide distribution. Several years later Sunshine cups and Sunshine souffles were brought out. The paper trade is well aware of the success these items achieved.

"For the last twenty years I have made yearly trips from the Atlantic to the Pacific contacting the leading paper outlets throughout the country. As I operated on some lines almost entirely through brokers I built up an excellent brokerage organization.

"While my immediate purpose is to establish a local sales service in the New York Metropolitan territory, I plan eventually to make available to manufacturers a brokerage organization of national scope each unit of which will be an experienced and successful local sales agency.

"In the New York Metropolitan district I plan to confine my lines to paper items distributed through paper jobbers and large national chain outlets where my long and close contact has made me many good friends." Mr. Breschel's address is 17 East 57th street, New York City—telephone, Plaza 8-0091.

New York Market Review

Office of THE PAPER TRADE JOURNAL,
Wednesday, October 26, 1938..

Improvement continues to be reported in the wholesale paper market. The trend of all commercial activity is now upward and the prevailing opinion of practically all business men is that the gradual recovery now in progress will continue. The outlook for the final month of the year and for business early next year is decidedly encouraging and the general paper merchant faces a much better market situation than was present last year.

The index of general business activity which has been upward since the middle of June, is now at 87.7 per cent, or about 3½ per cent higher than a week ago. The production ratio of over 200 paper mills stands at 83 per cent, and paper board production at 70 per cent. Wholesale sales volume is quite generally reported as improved for the current week. A relatively large number of manufacturers, representtives, jobbers, and general paper merchants report sales are above the volume of the corresponding period last year.

Wholesale prices, in general, continue quite firm and no important increase in quotations are expected by the trade. Wholesale prices commonly move slowly in comparison to the trend of general business activity, and the paper trade is influenced by the same economic factors and political influences which affect all business. The major factor which now appears to exert a strong influence against higher prices, is the activity of the Federal National Economic Committee, popularly called the Monopoly Investigation, which is now making a thorough survey of all economic conditions. Again, the relationship of raw materials and finished goods is dissimiliar to that which prevailed at this season last year. The trend of aggregate costs is upward, but prices are likely to be held down with little probability that the prices of finished consumer goods, such as paper, will be reduced to any important extent.

The demand for many grades of paper is reported improved for the current week. Sulphite papers are in greater demand. Production and distribution of tissues is at a relatively high level. Production of kraft papers continues at a high level and orders are well balanced with mill output. All paper prices are reported as relatively firm.

Mechanical Pulp

More orders are reported being received for mechanical pulp and this has resulted in an increase in the price of No. 1 domestic and Canadian pulp, which is currently quoted at from $29 to $33 per ton.

Chemical Pulp

The trend of prices on all grades of chemical pulp is uncertain and this market may be characterized as irregular so far as the current price situation is concerned. Consumption is reported increasing and a slight improvement in the volume of orders is reported for this week. A gradual improvement is looked for in the trade to continue as the general business situation continues to improve. Quotations on several grades of European and domestic pulps are a little lower. Prime bleached sulphite is quoted at from $47 to $55 per ton, while No. 1 kraft is quoted at from $33 to $37 per ton, on dock, Atlantic ports. Domestic kraft is quoted at from $30 to $33 per ton, f.o.b., pulp mill.

Old Rope and Bagging

The old rope market is relatively firm with a limited amount of business reported for this week. Prices hold firm at prevailing levels. The demand for old bagging is now rather light with roofing bagging in good demand and prices firm.

Rags

Improvement is reported in the demand for the higher grades of new domestic rags and prices are firm for all whites under reports of small accumulations. Supply of all lower grades of rags is ample. Prices are unchanged on all grades of domestic rags for this week. The foreign rag market is inactive and prices are strictly nominal.

Waste Paper

No important change in either demand or prices is reported in the waste paper trade this week. Transactions are rather limited, with some grades showing more firmness, while the lower grades are soft. The tone of the market is rather weak. Prices are unchanged and conform to prevailing representative prices.

Twine

A little improvement is reported in some grades of twine. Prices, in general, remain fairly firm on all grades of hard and soft fiber twines, with no important changes reported for the current week.

Unit Heaters

Bulletin No. 3137, just issued by the Buffalo Forge Company, Buffalo, N. Y., describes the new 1939 stream-lined Model C Breeze-Fin unit heater. The company states the new casing is rounded, stronger and more rigid than heretofore, the fan gives greater capacity with less air noise, and louvers are of pressed steel. Motors of various types furnished by the company or of other manufacture may be used. Ratings of the unit heaters are tested and rated according to the code of the Industrial Unit Heater Association, and the American Society of Heating and Ventilating Engineers.

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL
Wednesday, October 26, 1938.

BLANC FIXE—Quotations on blanc fixe continue firm and unchanged at prevailing market prices. The pulp is quoted at from $42.50 to $45 per ton, in bulk; the powder is offered at from 3½ to 3¾ cents per pound, in barrels, at works.

BLEACHING POWDER—The prices of bleaching powder remain firm and conform to prevailing market levels. Bleaching powder is quoted at from $2 to $2.25 per 100 pounds, in drums, at works.

CASEIN—The demand for casein is reported as fair. Standard quality domestic casein, 20-30 mesh, is quoted at 8½ cents per pound; 80-100 mesh, at 9 cents per pound; all prices in bags, car lot quantities.

CAUSTIC SODA—Quotations on caustic soda continue firm and conform to prevailing market prices. Solid caustic soda is quoted at from $2.10 to $2.30 per 100 pounds; flake and ground at from $2.50 to $2.70 per 100 pounds, in drums, at works.

CHINA CLAY—Quotations on china clay continue firm and conform to prevailing market prices. Imported clay is quoted at from $14.50 to $25 per ton, ship side. Domestic filler clay is quoted at from $6.50 to $12 per ton; coating clay at from $11 to $22 per ton, at mines.

CHLORINE—Quotations on chlorine are firm and unchanged at prevailing market prices. Chlorine is quoted at $2.15 per 100 pounds, in single-unit tank cars, f.o.b., works.

ROSIN—The demand for rosin is reported as improved for the current week. "G" gum rosin is quoted at $4.95; "FF" wood rosin at $4.85 per 280 pounds, gross weight, in barrels, at Savannah. Seventy per cent gum rosin size is quoted at $2.72 per 100 pounds, f.o.b., shipping point.

SALT CAKE—Quotations on salt cake remain firm and conform to prevailing market prices. Quotations range at from $12 to $13.50 per ton; chrome salt cake at from $11 to $12 per ton, f.o.b., shipping point. Imported salt cake is quoted at from $14.50 to $15 per ton, Gulf or Atlantic Seaboard, on dock.

SODA ASH—Quotations on soda ash are firm and continue unchanged at prevailing market prices. Quotations on soda ash in car lots, at works, per 100 pounds, are as follows: in bulk; $.90; in bags, $1.05; and in barrels, $1.35.

STARCH—The corn starch market is reported as firm. Quotations remain unchanged for the current week. Globe pearl is quoted at $2.40 per 100 pounds, in bags, and at $2.65 in barrels. Special paper starch is quoted at $2.50 per 100 pounds, in bags, and at $2.75 in barrels; all prices in car lots, f.o.b., Chicago.

SULPHATE OF ALUMINA—Quotations on sulphate of alumina remain firm and conform to prevailing representative market prices. The commercial grades are quoted at $1.15; iron free at $1.30 per 100 pounds, in barrels, car lot quantities, f.o.b., works.

SULPHUR—The demand for sulphur is reported as good for the current week. Annual contracts are quoted at $16 per long ton, f.o.b., mines. Spot and nearby car lots are quoted at $19 per ton.

TALC—The prices of talc are firm and continue unchanged at representative quoted market prices. Domestic talc is offered at from $15 to $18 per ton, Eastern mines. Imported talc is quoted at from $25 to $40 per ton, on dock.

Market Quotations

Paper

(Delivered New York)

News, per ton—
Roll, contract.....$50.00 @ —
Sheets .....58.00 @ —

Kraft—per cwt.—Delivered Zone A

No. 1 Northern....$4.75 @$5.25
Superstandard .... 4.12½ @ 4.62½
Northern Standard Wrapping ..... 4.00 @ —
Standard Wrapping 3.50 @ —

Tissues—Per Ream—Carlots

White No. 1..... .92½ @ —
White No. 1 M. G. .90 @ —
White No. 1½.... .67½ @ —
White No. 2..... .60 @ —
Anti-Tarnish M. G. .75 @ —
Colored ..... .87½ @ —
Kraft ..... .75 @ —
Manila ..... .60 @ —
Unbl. Toilet, 1 M.. 3.20 @ —
Bleached Toilet.... 5.26 @ —

Paper Towels—

Unbleached ..... 1.80 @ —
Bleached ..... 2.10 @ —

Manila—per cwt.—C. l. f. a.

No. 1 Jute.....$8.25 @$9.75
No. 2 Jute..... 7.50 @ 9.00
No. 1 Manila Wrapping, 35 lb..... 5.00 @ —
No. 2 Manila Wrapping, 35 lb..... 4.75 @ —

Boards, per ton—

News .....$27.50 @$30.00
Chip ..... 27.50 @ 30.00
Sgl. Mla. Ll. Chip. 42.50 @ —
Jute Lined Chip... 42.50 @ 45.00
White Pat. Coated. 55.00 @ 57.50
Kraft Liners..... 42.50 @ 50.00
Binders Boards..... 71.00 @77.00

The following are representative of distributors' resale prices:—

Rag Content Bonds and Ledgers—
White, Assorted Items,
Delivered in Zone 1:

	Bonds	Ledgers
100% Rag Ext. No. 1.	$39.10@$46.00	$40.25@$47.25
100% Rag	31.05@ 36.50	32.20@ 37.75
85% Rag	.....	29.90@ 35.00
75% Rag	23.60@ 27.75	24.75@ 29.00
65% Rag	.....	21.65@ 26.25
50% Rag	17.55@ 21.50	18.70@ 22.75
25% Rag	14.65@ 17.75	15.80@ 19.25

Colors at $1.00 cwt. extra

Sulphite Bonds and Ledgers—
White, Assorted Items,
Delivered in Zone 1:

	Bonds	Ledgers
No. 1	$8.80@$10.75	$9.95@$12.00
No. 2	7.90@ 9.50	9.05@ 11.00
No. 4	7.00@ 8.50	8.20@ 10.00

Colors $1.00 cwt. extra.

Free Sheet Book Papers—
White, Cased Paper,
Delivered in Zone 1:

No. 1 Glossy Coated	$10.80@$12.25
No. 2 Glossy Coated	9.25@ 10.50
No. 3 Glossy Coated	8.15@ 9.25
No. 4 Glossy Coated	7.65@ 8.75
No. 1 Antique (watermarked)	7.65@ 8.75
No. 2 Offset	7.00@ 8.00
A Grade E. F.	6.80@ 7.75
A Grade S. & S. C.	7.05@ 8.00
B Grade E. F.	6.25@ 7.25
B Grade S. & S. C.	6.50@ 7.50
C Grade E. F.	6.00@ 7.00
C Grade S. & S. C.	6.25@ 7.25
D Grade E. F.	5.70@ 6.75
D Grade S. & S. C.	5.95@ 7.00

Ivory & India at $.50 cwt. extra.

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—
Moist .....25.00 @28.00
Dry .....25.00 @28.00

(Delivered)

No. 1 Domestic and Canadian .....29.00 @33.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—

Prime Bleached Sulphite ..... 2.35 @ 2.75

Prime Qualities Bleaching Sulphite ..... 1.90 @ 2.10

Sulphite ..... 1.80 @ 2.00

(On Dock, Atlantic Ports)

Kraft Bleached..... 2.50 @ 2.75
Kraft Light & Strong 1.90 @ 2.00
Kraft No. 1..... 1.65 @ 1.85
Kraft No. 2..... 1.50 @ 1.65

(F.o.b. Pulp Mill)

Kraft Domestic..... 1.50 @ 1.90

(Delivered)

Soda Bleached..... 2.55 @ —

Add 60 cents per short ton, dock charges for Albany; $2.50 for Lake Ports East and $3.50 for Lake Ports West of Mackinac Straits.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—
New White, No. 1. 6.75 @ 7.00
Silesias No. 1..... 4.00 @ 4.25
New Unbleached.. 6.75 @ 7.00
Blue Overall..... 5.50 @ 5.75
Fancy ..... 2.10 @ 2.25
Washables ..... 1.60 @ 1.70
Mixed Khaki Cuttings ..... 3.25 @ 3.75
O. D. Khaki Cuttings 4.00 @ 4.25

Old Rags

White, No. 1—
Repacked ..... 3.15 @ 3.40
Miscellaneous ..... 2.60 @ 2.75
White, No. 2—
Repacked ..... 1.90 @ 2.10
Miscellaneous .... 1.50 @ 1.60
Thirds and Blues—
Repacked ..... 1.40 @ 1.50
Miscellaneous ..... 1.25 @ 1.30
Roofing Rags—
No. 1..... 1.00 @ 1.10
No. 2..... .85 @ .90
No. 3 (bagging)... .85 @ .90
No. 4..... .65 @ .70
No. 5A..... .65 @ .70

Foreign Rags

New Rags

New Dark Cuttings.. 2.25 @ 2.40
New Mixed Cuttings. 2.00 @ 2.20
New Light Silesias.. 5.50 @ 5.75
Light Flannelettes... 5.50 @ 5.75
New White Cuttings. 7.00 @ 7.50
New Light Oxford.. 4.00 @ 4.50
New Light Prints... 3.00 @ 3.25

Old Rags

No. 1 White Linens. 7.50 @ 8.50
No. 2 White Linens. 6.50 @ 7.50
No. 3 White Linens. 4.50 @ —

J. Andersen & Co.

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CHEMICAL & MECHANICAL PULP

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Greaker, Norway
BRÖVIK OCH ALA NYA AKTIEBOLAG
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All kinds and styles of Felts for all kinds and styles of Papers.

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Steel, Copper, Brass
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ENGLISH ECCO CLAYS CLAYS

ECCO CLAYS TRADE MARK

UNIFORM • SUPERIOR • DEPENDABLE

English China Clays Sales Corporation
551 Fifth Avenue, New York City

No. 4 White Linens	2.25	@	3.25
No. 1 White Cotton	4.25	@	4.75
No. 2 White Cotton	3.25	@	3.75
No. 3 White Cotton	2.50	@	3.00
No. 4 White Cotton	1.90	@	2.20
Extra Light Prints	2.00	@	2.40
Ord. Light Prints	1.75	@	2.15
Med. Light Prints	1.55	@	1.95
Dutch Blue Cottons	2.25	@	2.50
French Blue Linens	3.00	@	—
Checks and Blues	2.00	@	—
Linsey Garments	1.90	@	2.00
Dark Cottons	1.50	@	1.60
Old Shopperies	1.30	@	1.45
New Shopperies	1.45	@	1.50
French Blues	2.25	@	2.50

Old Rope and Bagging

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	2.40	@	2.50
Domestic	2.25	@	2.35
Wool Tares, light	1.80	@	1.90
Wool Tares, heavy	1.90	@	2.00
Bright Bagging	1.70	@	1.80
Manila Rope—			
Foreign	2.90	@	3.00
Domestic	2.50	@	2.75
Jute Threads	2.75	@	3.00
Sisal Strings	1.50	@	1.60
Mixed Strings	.60	@	.70

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	2.65	@	2.70
Ordinary Hard White No. 1	1.90	@	2.00
Soft White No. 1	1.75	@	1.80
Soft White Extra	2.25	@	2.40
Flat Stock—			
Stitchless	.80	@	.85
Overissue Mag	.70	@	.75
Solid Flat Book	.60	@	.65
Crumbled No. 1	.40	@	.45
Ledger Stock White	1.15	@	1.25
Ledger Stock Colored	.65	@	.70
New B. B. Chips	.15	@	.20
Manila—			
New Env. Cut	1.40	@	1.50
New Cuttings	1.25	@	1.35
Old Kraft Machine—			
Compressed bales	.65	@	.75
News—			
No. 1 White News	1.35	@	1.40
Strictly Overissue	.50	@	.55
Strictly Folded	.30	@	.35
No. 1 Mixed Paper	.15	@	.20

Twines

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.11	@	.13
White Hemp	.12	@	.14
Fine Polished—			
Fine India	.15	@	.17
Unpolished—			
Box	.08½	@	—
Paper Makers	.07½	@	.08½
Tube Rope	.09	@	.10
Wall Paper	.10	@	.11
Wrapping	.11	@	.13
Soft Fiber Rope	.09½	@	.11½
Cotton	.15	@	.20

(Hard Fiber)

Medium Java	.09	@	.10
Mex. Sisal	.08½	@	.09½
Manila	.18	@	.25
Domestic	2.65	@	2.75
Sisal Rope	1.65	@	1.85
Mixed Rope	.50	@	.75
Transmission Rope	1.90	@	2.00
Soft Jute Ropes	1.85	@	2.00
Jute Carpet Threads	.75	@	.90
Gunny Bagging—			
Foreign	2.25	@	—
Domestic	2.00	@	—
Bleachery Burlap	3.25	@	3.62½
Scrap Burlap—			
Foreign	1.65	@	1.85
Domestic	1.40	@	1.55
Scrap Sisal	1.25	@	1.50
Scrap Sisal for Shredding	1.75	@	1.90
Wool Tares, Heavy	1.65	@	1.85
New Burlap Cuttings	2.00	@	2.25
Aust. Wool Pouches	2.75	@	3.10
Heavy baling bagging	2.00	@	—
Paper Mill Bagging	1.00	@	1.15
No. 2 Bagging	.60	@	.70

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.03¼	@	.03½
New White No. 1	.06¾	@	.07
New Light Flannelettes	.04¼	@	.04¾
Silesias No. 1	.04¼	@	.04½
New Black Silesias	.03¾	@	.04
Silesias No. 1			
Soft Unbleached	.06¼	@	.06¾
Blue Cheviots	.05	@	.05¼
Fancy	.03	@	.03¼
Washable	.02¾	@	.03
Cottons—according to grade—			
Blue Overalls	.04¾	@	.05
New Black, soft	.03¾	@	.04
Khaki Cuttings	.03¼	@	.03½
O. D. Khaki	.04	@	.04½
Corduroy	.02¾	@	.03
New Canvas	.06¾	@	.07½
B.V.D. Cuttings	—	@	.06½

Domestic Rags (Old)

(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	—	@	2.75
Miscellaneous	2.50	@	2.75
White No. 2—			
Repacked	1.90	@	2.00
Miscellaneous	2.00	@	2.25
Twos and Blues	1.75	@	2.00
Old Blue Overalls	1.50	@	—
Third and Blues—			
Repacked	1.37½	@	1.75
Miscellaneous	1.25	@	1.65½
Black Stockings	3.90	@	4.00
Roofing Stock—			
No. 1	1.00	@	1.10
No. 2	.75	@	.85
No. 3	.65	@	.70

Foreign Rags

(F. o. b. Boston)

Dark Cottons	1.05	@	1.15
Dutch Blues	2.65	@	2.75
New Checks and Blues	2.85	@	3.00
Old Fustians	2.25	@	2.50
Old Linsey Garments	2.20	@	2.35
New Silesias	4.75	@	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1	.06	@	.06¼
New White, No. 2	.03½	@	.04
Light Silesias	.03½	@	.04
Silesias, No. 1	—	@	.04½
Black Silesias, soft	—	@	.03
New Unbleached	.05½	@	.06
Washable, No. 1	.01½	@	.01¾
Blue Overall	.04	@	.04½
Cottons—According to grades—			
Washable No. 2	.01	@	.01¼
New Blue	.01	@	.01¼
Fancy Percales	—	@	.02½
New Black Soft	.03	@	.03½
New Light Seconds	—	@	.04½
New Dark Seconds	.50	@	.75
Khaki Cuttings—			
No. 1 O. D.	.03	@	.03½
No. 2 Mixed	.02	@	.02½
Corduroy	—	@	.02
New Canvas	.05	@	.05½
New Black Mixed	.02½	@	.02¾

Domestic Rags (Old)

White No. 1—			
Repacked	3.00	@	3.25
Miscellaneous	2.50	@	2.75
Thirds and Blues—			
Miscellaneous	1.00	@	1.25
Repacked	1.50	@	1.75
Black Stockings (Export)	3.00	@	3.50
Roofing Stock—			
Foreign No. 1	—	@	.95
Domestic No. 1	—	@	.95
Domestic No. 2	—	@	.85
Roofing Bagging	—	@	.60

Bagging

(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	1.75	@	2.00
Domestic	1.50	@	1.75
Manila Rope	2.75	@	3.00
Sisal Rope	1.50	@	1.75
Mixed Rope	.75	@	1.00
Scrap—			
No. 1	—	@	1.50
No. 2	1.00	@	1.25
Wool Tares, heavy	3.25	@	3.50
Mixed Strings	.75	@	1.00
No. 1 New Light Burlap	2.50	@	3.00
New Burlap Cuttings	1.75	@	2.00

Old Papers

(F. o. b. Phila.)

Shavings—			
No. 1 Hard White	2.25	@	2.30
No. 2 Hard White	1.90	@	2.00
No. 1 Soft White	1.75	@	1.80
No. 2 Soft White	1.30	@	1.40
No. 1 Mixed	.65	@	.75
Solid Ledger Stock	1.45	@	1.50
Ledger Stock, white	1.15	@	1.20
Ledger Stock, colored	.75	@	.80
No. 1 Books, heavy	.60	@	.75
Manila Cuttings	1.45	@	1.50
Print Manila	.40	@	.45
Container Manila	.35	@	.40
Kraft Paper	.75	@	.80
No. 1 Mixed Paper	.20	@	.25
Straw Board Chip	.25	@	.30
Binders Board Chip	.25	@	.30
Corrugated Board	.50	@	.55
Overissue News	.40	@	.45
Old Newspapers	.35	@	.40

BOSTON

Old Papers

(F. o. b. Boston)

Shavings—			
No. 1 Hard White	2.25	@	2.50
No. 1 Soft White	1.85	@	2.15
No. 2 Mixed	.75	@	.80
Solid Ledger Books	1.50	@	1.75
Overissue Ledger Stock	1.30	@	1.50
Mixed Ledgers	.85	@	.90
No. 1 Books, heavy	.65	@	.75
No. 1 Books, light	.65	@	.75
Crumpled Stitchless Book Stock	.55	@	.65
Manila Env. Cuttings	1.85	@	2.00
Manila Envelope Cuttings, extra quality	2.00	@	2.10
No. 1 Old Manila	.95	@	1.00
White Blank News	1.30	@	1.40
No. 1 Kraft	.80	@	—
Mixed Papers	.15	@	—
Print Manila	.45	@	.55
Container Manilas	.27½	@	—
Old Newspapers	.25	@	.32½
Paper Wool Strings	.80	@	—
Overissue News	.45	@	.50
Box Board Chips	.20	@	.25
Kraft corrugated boxes	.70	@	—
Kraft corrugated boxes	.65	@	.70
Screening Wrappers	.40	@	.45

Bagging

(F. o. b. Boston)

Manila Rope—			
Foreign	3.00	@	3.15

CHICAGO

Old Papers

(F. o. b. Chicago)

Shavings—			
No. 1 White Envelope Cuttings	1.80	@	1.90
No. 1 Hard White	1.70	@	1.80
No. 1 Soft White	1.50	@	—
Ledger & Writings	.75	@	.80
Solid Books	.55	@	—
Blanks	.90	@	—
Krafts	.60	@	—
New Kraft Cuts	1.10	@	—
Manila Env. Cuts	Nominal		
Ex. No. 1 Manila	Nominal		
Print Manila	Nominal		
Overissue News	.35	@	—
Old Newspapers—			
No. 1 Folded News	.30	@	—
No. 1 Mixed Paper	.20	@	—
Roofing Stocks—			
No. 1	2.00	@	1.10
No. 2	1.85	@	1.90

TORONTO

Paper

Bonds and Ledgers

Delivered

No. 1 White	.36½	@	—
No. 1 Tints	.37½	@	—
No. 2 White	.26½	@	—
No. 2 Tints	.27½	@	—
No. 4 White	15.50	@	16.50
No. 4 Tints	16.50	@	—
No. 5 Bond—White	11.25	@	—
No. 5 Bond—Tints	12.25	@	—
No. 5 Bond—Golden Rod	12.75	@	—
No. 5 Ledger—White	11.25	@	—
No. 5 Ledger—Tints	11.25	@	—
No. 6 Bond—White	10.15	@	—
No. 6 Bond—Tints	10.65	@	—
No. 6 Bond—Golden Rod	12.15	@	—
No. 7 Bond—White	8.50	@	—
No. 7 Bond—Tints	9.00	@	—
No. 7 Bond—Golden Rod	10.50	@	—
Book—			
No. 1 M. F.	7.35	@	—
No. 2 M. F.	6.85	@	—
No. 3 M. F.	5.65	@	—
No. 1 S. C.	7.60	@	—
No. 2 S. C.	7.10	@	—
No. 3 S. C.	6.10	@	6.35
No. 1 Coated Book and Litho	12.50	@	—
No. 2 Coated Book and Litho	11.00	@	—
No. 3 Coated Book and Litho	10.00	@	—
Coated tinted	13.50	@	—
Wrapping—delivered—			
Rag Brown	4.85	@	5.25
White Wrap	4.00	@	—
"B" Manila	4.90	@	6.15
No. 1 Manila	5.50	@	6.90
Fiber	5.50	@	6.90
Kraft No. 2	5.50	@	6.90

(F. o. b. Cars, Toronto)

News per ton—			
Rolls (contract)	$46.00	@	—
Sheets	54.00	@	—

Pulp

Ground wood	29.00	@	—
Unbleached Sulphite	49.00	@	—
Kraft	50.00	@	—
Soda	54.00	@	—

Old Waste Paper

(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut	2.25	@	—
Soft White	2.15	@	—
White Blk. News	1.25	@	—
Book and Ledger—			
Flat Magazine and Book Stock (old)	.80	@	—
Light and Crumpled Book Stock	.70	@	—
Ledgers and Writings	1.10	@	—
Manilas—			
New Manila Cut	1.35	@	—
Printed Manilas	.45	@	—
Kraft	.95	@	—
News and Scrap—			
Strictly Overissue	.50	@	—
Strictly Folded	.45	@	—
No. 1 Mixed Paper	.30	@	—

Domestic Rags

(Price to mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.06¼	@	.07
Fancy Shirt Cuttings	.02¼	@	.03½